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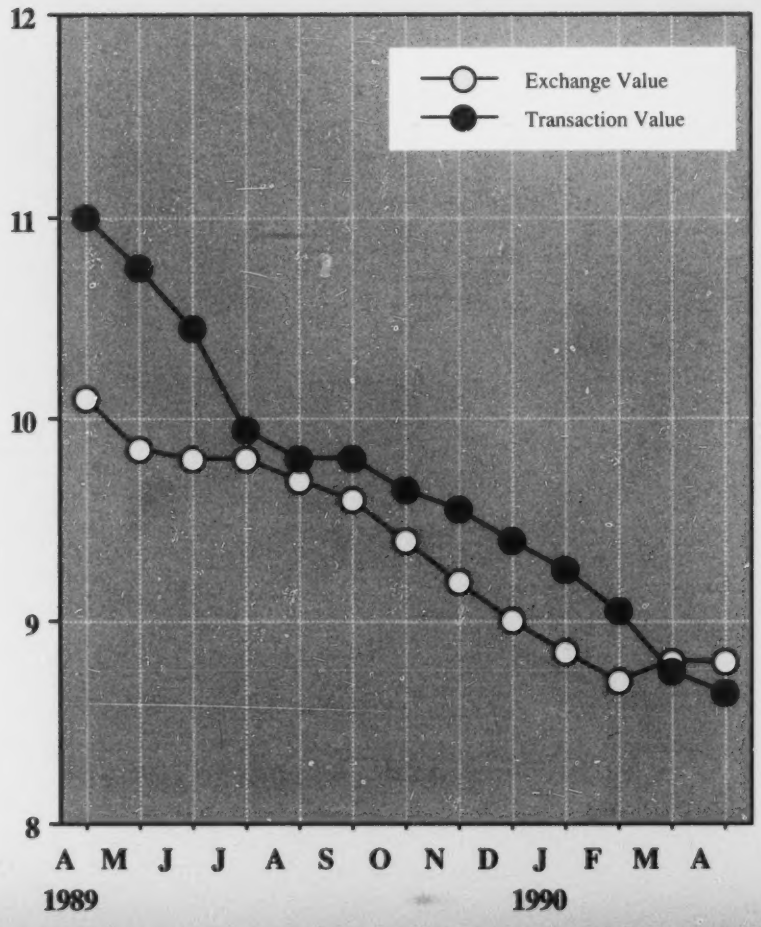
NUEXCO

Monthly Report

May 1990 **Number 261**

The Economic Future of the US Uranium Industry 18

International Atomic Energy Agency 24



NUEXCO

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ISSN 0742-4582

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NUEXCO MONTHLY REPORT
May 1990, No. 261

* * *

EXECUTIVE SUMMARY
(As of April 30, 1990)

Exchange Value
$8.80, unchanged

The **Exchange Value** is **$8.80** per pound U_3O_8, unchanged from March 31.

UF_6 Value
$24.40, unchanged

The **UF_6 Value** is **$24.40** per kg U as UF_6, unchanged from the March 31 UF_6 Value.

Uranium Sales; Supply and Demand

Thirteen April **uranium** sales involved **4.8 million** pounds equivalent U_3O_8. All 13 of these sales involved spot or near-term delivery and met the conditions for inclusion in the Transaction Value. Active spot and near-term **uranium supply** amounts to **1.3 million** pounds equivalent U_3O_8, down from 3.8 million pounds at the end of March. Active spot and near-term **uranium demand** totals **4.6 million** pounds, up from 4.5 million pounds on March 31. The spot and near-term **supply-demand ratio** is **0.3 to 1**, down from the March 31 figure of 0.9 to 1.

Transaction Value
$8.65, down $0.10

The **Transaction Value** is **$8.65** per pound U_3O_8, down $0.10 from March 31. The calculation includes 24 transactions over a period of three months involving a total of 8.4 million pounds equivalent U_3O_8.

Loan Rate
3.5%, unchanged

The **Loan Rate** remains at **3.5 percent** per annum, and six current natural uranium loans are reported involving over 2.5 million pounds equivalent U_3O_8.

Conversion Value
$1.45, unchanged

The **Conversion Value** is **$1.45** per pound U as UF_6, unchanged from March 31. One transaction for conversion services is reported.

SWU Value
$50, unchanged

The **SWU Value** remained at **$50** per SWU, and no SWU sales are reported. Active supply is down from 345 to 145 thousand SWU, and active demand increased from 95 thousand to 1.9 million SWU.

* * *

The Economic Future of the US Uranium Industry

The US uranium industry is no longer the world leader it was only a decade ago. A speech presented by NUEXCO's Thomas C. Pool to the US Geological Survey analyzes the US uranium industry and how it relates to future levels of exploration, production, and employment.

International Atomic Energy Agency

The International Atomic Energy Agency (IAEA) is perhaps best known for its nuclear material safeguarding system, but for more than 30 years it has been a leading international authority on all applications of nuclear energy. It is the preeminent organization for advancing peaceful uses of atomic power.

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NUEXCO MONTHLY REPORT 261 FIGURES OF THE MONTH (April 30, 1990)	This Month (Report 261)	Last Month (Report 260)	12 Months Ago (Report 249)
Exchange Value ($US per pound equivalent U_3O_8)	8.80	8.80	10.10
UF_6 Value ($US per kg U as UF_6)	24.40	24.40	30.50
Transaction Value ($US per pound equivalent U_3O_8)	8.65	8.75	11.00
Loan Rate (Per Annum)	3.5%	3.5%	3.5%
Conversion Value ($US per pound U as UF_6)	1.45	1.45	1.95
Near-Term Uranium Supply [1] (million pounds equivalent U_3O_8)	1.3	3.8	4.8
Near-Term Uranium Demand [2] (million pounds equivalent U_3O_8)	4.6	4.5	1.3
Near-Term Supply-Demand Ratio	0.3	0.9	3.8
Recent Uranium Sales: [3]			
Number of Transactions	14	8	15
Quantity of Material (Million pounds equivalent U_3O_8)	7.5	5.2	6.0
Nuexco SWU Value: ($US per SWU)			
at 0.3 tails assay	50	50	67
US DOE SWU Prices: ($US per SWU)			
USEC	117.85 [4]	117.85 [4]	117.00 [5]
AFC	153.00 [6]	153.00 [6]	153.00 [6]
Requirements	157.00 [6]	157.00 [6]	157.00 [6]
Incentive Price (IP1)	90.00 [7]	90.00 [7]	90.00 [7]
Market Value of Enriched UF_6 [8]**:** ($US per kg U as UF_6)			
2.5 w/o U_{235}	267	267	334
3.0 w/o U_{235}	343	343	431
3.5 w/o U_{235}	421	421	530
4.0 w/o U_{235}	500	500	630

[1] Active inquiries to sell, for delivery within 12 months measured from the date of this Report.

[2] Active inquiries to purchase, for delivery within 12 months measured from the date of this Report.

[3] Uranium sales only; does not include loans, conversion, or SWU transactions.

[4] Effective 10/1/89 to 9/31/90.

[5] Effective from 10/1/87 to 9/31/89.

[6] Effective since 10/1/84.

[7] Effective from 10/1/86 to 9/31/90, for up to 30% of annual requirements. DOE chose to waive application of the GNP deflator for FY87-FY90 deliveries.

[8] Calculated using the NUEXCO Exchange Value, Conversion Value, SWU Value and 0.30 percent tails assay.

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NUEXCO Monthly Report

May 1990
No. 261

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Other NUEXCO Publications:
Annual Review, Uranium Market Study; International Directory of Nuclear Utilities (IDNU), International Directory of Uranium Producers (IDUP)

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To Our Readers

We are pleased to announce two personnel reassignments. Effective May 1, 1990, Charles H. Peterson, President of NUEXCO International Corporation and of NUEXCO Information Services, became Vice-Chairman – International Business Affairs for NUEXCO's parent organization, CONCORD. He will also assume the duties of President and Chief Operating Officer of CONCORD Trading Corporation, a company engaged in international trading on a broad basis. Chuck will transfer to our Washington D.C. office, to better develop CONCORD's trading business and to interact with CONCORD's offices throughout the world.

Earl E. Hoellen will assume additional responsibilities and lead CONCORD's nuclear fuel cycle activities as President and Chief Operating Officer of NUEXCO. Earl will continue to head NUEXCO Trading Corporation, while taking on responsibility for all NUEXCO information and fuel cycle services.

These adjustments will enable CONCORD/NUEXCO to more readily adapt to worldwide market changes and pursue growth opportunities, while maintaining coordination of the various functional areas of NUEXCO.

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MARKET VALUES SUMMARY
April 30, 1990

Market Values	This Month (Report 261)	Active Supply* (thousand pounds equivalent U_3O_8)	Active Demand* (thousand pounds equivalent U_3O_8)
EXCHANGE VALUE[1]	**$8.80**/lb U_3O_8	1,300**	4,610**
UF_6 VALUE[2]	**$24.40**/kg U as UF_6		
LOAN RATE[3]	**3.5%**/annum	7,170	0
CONVERSION VALUE[4]	**$1.45**/lb U as UF_6	150	1,490
SWU VALUE[5] **0.3 tails assay:**	**$50**/SWU	145	1,890
TRANSACTION VALUE[6]	**$8.65** Per Pound U_3O_8	**24** Transactions	**3** Months / **8.4** Million Pounds

* Supply and demand tables in the *Current Market Data* section of this Report detail the numbers for each category.

** Includes uranium concentrates and uranium hexafluoride.

DEFINITIONS

1 The **Exchange Value** is NUEXCO's judgment of the price at which transactions for significant quantities of natural uranium concentrates could be concluded as of the date indicated.

2 The **UF_6 Value** is NUEXCO's judgment of the price at which spot and near-term transactions for significant quantities of natural uranium hexafluoride could be concluded as of the date indicated.

3 The **Loan Rate** is NUEXCO's judgment of the annual interest rate at which uranium loans could be concluded as of the date indicated.

4 The **Conversion Value** is NUEXCO's judgment of the price at which spot and near-term transactions for significant quantities of conversion services could be concluded in the secondary market as of the date indicated.

5 The **SWU Value** is NUEXCO's judgment of the price at which spot and near-term transactions for significant quantities of enrichment services could be concluded as of the date indicated.

6 The **Transaction Value** is a weighted average price of recent natural uranium sales transactions. The calculation is based on prices paid in:
a. Transactions closed within the previous three month period for which delivery is scheduled within one year of the transaction date;
b. At least ten transactions;
c. Transactions involving a sum total of at least 2 million pounds U_3O_8 equivalent.

DERIVATIONS AND COMMENTS

- All **Market Values** are based on:
  - Data from recently completed transactions.
  - Data from pending transactions.
  - Firm bids to buy or borrow, and firm offers to sell or lend.
  - Prices purchasers or rates borrowers have expressed a willingness to pay, but for which NUEXCO is not aware of firm bids to buy or borrow and prices sellers or rates lenders have expressed a willingness to accept, but for which NUEXCO is not aware of firm offers to sell or lend.
- Prices associated with deliveries under old or renegotiated contracts or other than arm's-length transactions are not included in the determination of these **Market Values**.
- In the determination of prices, NUEXCO does not consider charges for transportation other than that customarily provided by suppliers.
- The prices of services or materials delivered under long-term contracts with primary suppliers are not considered in the determination of the listed values.
- For the **SWU Value**, NUEXCO converts SWU prices at varying tails and product assays to equivalent SWU prices at a tails assay of 0.30 weight percent U^{235} and a product assay of 3.0 weight-percent U^{235}, assuming feed costs corresponding to the NUEXCO **Exchange Value** and **Conversion Value** determined as of the same date.
- In calculating the **Transaction Value**, NUEXCO does not account for the price of uranium delivered in connection with contracts which call for "market price" mechanisms. This exclusion applies particularly to contracts in which delivery prices are expressed as a function of future **Exchange Values** or any other indeterminate variable. Also excluded from the calculation are any other transactions in which the delivery price is defined in such a way that it can not currently be determined.
- The sample time for the **Transaction Value** is extended as necessary to satisfy the minima for the number of transactions and quantity of material. Other currencies are converted to US dollars using conversion rates in effect on or near the transaction date.

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PRICING

APRIL MARKET REVIEW

(as of April 30, 1990)

NATURAL URANIUM AND CONVERSION

Short-term Market Activity

After an active month, all of the April 30 NUEXCO Market Values remained unchanged from their March 31 levels, except for the Transaction Value. Market activity throughout the month demonstrated that both buyers and sellers were unusually uncertain of market direction. Almost five million pounds equivalent U_3O_8 changed hands during April in thirteen near-term natural uranium sales. Eight concentrate sales included nearly three million pounds, while five UF_6 sales accounted for the balance of the near-term natural uranium market volume.

The April 30 **Exchange Value** held at **$8.80** per pound U_3O_8, and the eight near-term concentrates sales occurred at prices near that level. Sellers found the European concentrates market especially difficult because demand was relatively low. In order to elicit interest, sellers offered prices well below the Exchange Value, but even then few sales resulted because of the competitive advantage of purchasing UF_6. In contrast, demand for concentrates remained high in North America, though supply from traditional and unexpected sources has been adequate to preclude a further price rise. Producers continued their non-traditional role, appearing as buyers in five of the eight concentrate sales.

* * *

For the first time in seven months the **UF_6 Value** did not decline, remaining at **$24.40** per KgU as UF_6. The large oversupply that has characterized the UF_6 market in recent months has diminished, enough that the market imbalance that had been driving the price decline for the past 28 months has subsided, at least temporarily. Five natural UF_6 sales, totalling nearly two million pounds equivalent U_3O_8, took place at prices that varied widely both above and below the April 30 UF_6 Value. The prevailing market uncertainty led to deals being concluded with an unaccustomed variety of commercial terms, special considerations, and price levels. Some of the offers below the UF_6 Value contained other financial considerations which resulted in a higher evaluated price.

Nonetheless, sellers still appear to have ample material available and are prepared to compete aggressively, especially for sales to utilities. In each of the five April natural UF_6 sales the seller was an intermediary. In contrast to recent months, no enriched uranium product (EUP) transactions are reported.

* * *

The **Transaction Value** declined to **$8.65** per pound U_3O_8 based on 24 transactions over 3 months involving 8.4 million pounds. The Transaction Value is calculated using a weighted moving average of recent natural uranium sales, including both concentrates and UF_6. This three-month time period includes the lower priced sales from February and March, and is one reason the Transaction Value continued to decline. However, the primary reason for its decline is the discrepancy between the UF_6 Value and the sum of the values of its component parts. If calculated using the April 30 Exchange Value ($8.80) and Conversion Value ($1.45), the UF_6 Value would have been $26.19 per KgU as UF_6. However, under current conditions, the market assesses UF_6 at a substantially lower level, so the UF_6 Value is only $24.40 per KgU as UF_6 (not a calculated figure). Thus, the market is valuing UF_6 at a discount of $1.79 per KgU, relative to the combined worth of its components.

To calculate the Transaction Value, NUEXCO uses a volume-weighted average of both concentrate sales and the U_3O_8 component of UF_6 sales for three months (or more). In determining the effective price of the U_3O_8 component in a UF_6 sale, NUEXCO uses the UF_6 price of that particular sale and the current Conversion Value to derive the price for the U_3O_8 component to be used in the Transaction Value calculation. However, under current market conditions, that method yields low effective prices for the U_3O_8 component of UF_6 sales. For example, if a UF_6 sale was concluded at $25.00 per KgU as UF_6, using the April 30 Conversion Value of $1.45 per pound U as

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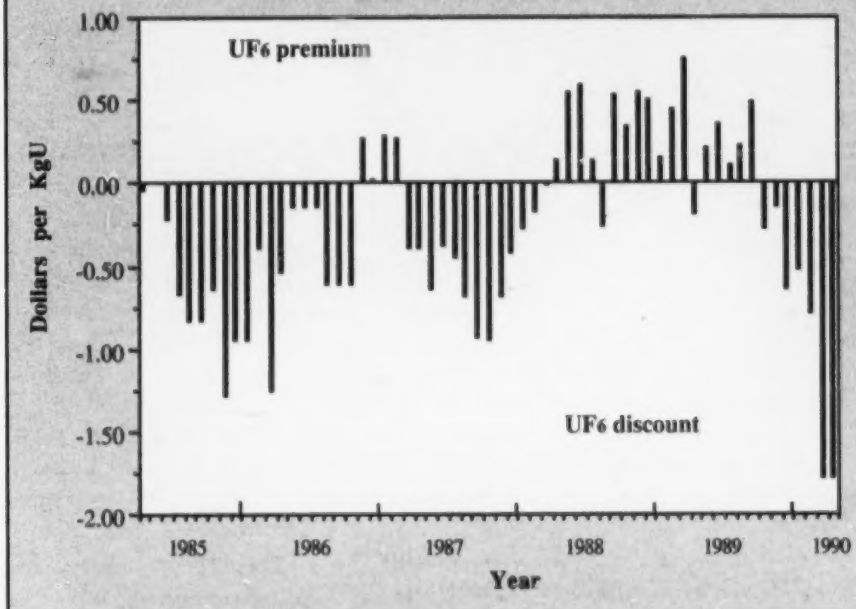
UF_6 would yield an effective price for the U_3O_8 component of only $8.34 per pound U_3O_8.

Given the current oversupply of UF_6 and resulting low-priced UF_6 sales, this approach can reduce the Transaction Value below the Exchange Value. The recent high volume of natural UF_6 sales accentuates this effect. However, under other circumstances, the market could be valuing UF_6 at a premium over its component parts, in which case the UF_6 sales included in the Transaction Value calculation would tend to hold the Transaction Value above the Exchange Value. **Figure 1** shows that variations between the UF_6 Value and the sum of its component values [(EV x 2.61284) + (CV x 2.20462)] are the rule rather than the exception. The $1.79 per KgU discount at which UF_6 was valued on April 30 is simply a continuation of the trend since October 1989 of discounted UF_6 prices due to the oversupply of UF_6 and the relative lack of demand for conversion services.

Figure 1
NUEXCO UF_6 VALUE LESS SUM OF UF_6 COMPONENT VALUES[1]



[1] UF_6 Value – [(EV x 2.61284) + (CV x 2.20462)]. If this expression exceeds zero, that represents a UF_6 premium relative to the sum of its components. If the expression is less than zero, it represents a discount.

* * *

Active uranium supply declined to **1.3** million pounds equivalent U_3O_8, over three million pounds less than **active uranium demand** of **4.6** million pounds equivalent U_3O_8. The resultant **supply/demand ratio** is **0.3**, marking its second month in a row below 1.0. Nevertheless, though supply sources are not specifically identified, it is highly likely that, just as last month, supply will be made available near current market levels as demand dictates.

Long-Term Market Activity

One long-term natural uranium sale is reported this month. A utility purchased over one million pounds of concentrates for delivery in the 1990s. Several utilities are evaluating long-term offers and several more are expected to seek long-term contracts in the upcoming months.

* * *

The **Loan Rate** remained at **3.5** percent per annum for April 30, 1990. Six current loans were concluded in April involving over two and a half million pounds equivalent U_3O_8. One loan that occurred in 1989 is also reported, but not included in the total volume. Specific loan rates varied from contract to contract, but due to the special conditions involved, the loans evaluated at levels near the Loan Rate.

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Special conditions on loans, such as flexible return dates or origin specifications, may have significant value to borrowers or lenders, and can affect a loan negotiation as much as the loan interest rate. A wide variety of market participants loaned and borrowed material in the past month, indicating further development of the nuclear fuel market as participants seek to utilize inventory to improve their returns on investment.

* * *

The **Conversion Value** was unchanged at **$1.45** per pound U as UF_6. Market conditions for secondary conversion services are very unpredictable at present. The UF_6 supply glut, though perhaps easing, has led to the wide discrepancy between the UF_6 Value and the sum of the values of its component parts. Although several secondary conversion sales are being negotiated at levels near the April 30 Conversion Value, occasionally discretionary buyers can command extraordinarily low prices from highly motivated sellers due to this inequality in the conversion market. In such instances, holders of UF_6 that need concentrates may be inclined to deeply discount the conversion component in order to deconvert their UF_6. For instance, in the one April conversion sale that occurred well below the April 30 Conversion Value, the buyer was able to obtain a far lower price than otherwise would have been acceptable, because the seller was anxious to acquire concentrates to fill other commitments.

ENRICHMENT SERVICES

The **SWU Value** remained at its previous level of **$50** per SWU. In a quiet month, no new SWU sales are reported, though several buyers, both North American and European, are evaluating offers. One spot-market SWU buyer examined the opportunities in the current market and decided to borrow enriched UF_6 rather than purchase SWU.

Several utilities evaluated long-term offers in the past month but were dissatisfied with the offers they received, and decided to delay major SWU purchases in expectation of a continuing soft SWU market. SWU supply declined as some sellers decided to withdraw temporarily from the market as well, but SWU demand increased to approximately 1.9 million SWU. The upcoming months should provide some indication of market direction, and alleviate some of the present market uncertainties.

In other enrichment developments, DOE announced another meeting with its USEC customers, to be held in Washington D.C. on June 21-22, 1990. Unexpectedly, DOE did not announce a new base price for fiscal year 1991 on April 1. An April 1 announcement had been expected in order for DOE to meet the 180-day notification requirement and have the new base price take effect at the beginning of FY91. The ceiling price for FY91 will be calculated as June 30, 1990. USEC customers for 1991 pay the lower of the base price or the ceiling price. ■

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MARKET VALUES EXPRESSED IN SELECTED CURRENCIES

EXCHANGE VALUE[1]

Country (currency)	per lb equivalent U3O8 as Concentrates			per kg U as Concentrates		
	This Month (Apr 30, 1990)	Last Month (Mar 31, 1990)	12 Months Ago (Apr 30, 1989)	This Month (Apr 30, 1990)	Last Month (Mar 31, 1990)	12 Months Ago (Apr 30, 1989)
Australia (dollar)	11.69	11.70	12.71	30.40	30.41	33.04
Belgium (comm. franc)	304.50	309.10	396.54	791.63	803.58	1.031
Canada (dollar)	10.24	10.31	12.04	26.62	26.81	31.30
EEC (ecu)	7.24	7.32	9.11	18.82	19.04	23.68
Finland (markka)	34.82	35.29	42.28	90.53	91.74	109.91
France (franc)	49.49	50.25	64.13	128.67	130.63	166.72
Italy (lira)	10,815	11,011	13,877	28,116	28,626	36,078
Japan (yen)	1,402	1,377	1,334	3,645	3,579	3,469
Netherlands (guilder)	16.59	16.82	21.37	43.13	43.72	55.55
So. Africa (comm. rand)	23.39	23.33	25.79	60.80	60.65	67.05
Spain (peseta)	933.29	956.11	1,176	2,426	2,486	3,056
Sweden (krona)	53.56	53.95	64.29	139.25	140.27	167.14
Switzerland (franc)	12.80	13.17	16.74	33.29	34.23	43.52
UK (pound)	5.38	5.38	5.97	13.99	13.99	15.53
US (dollar)	8.80	8.80	10.10	22.88	22.88	26.26
West Germany (mark)	14.77	14.93	18.95	38.39	38.82	49.26

TRANSACTION VALUE[1]

Country (currency)	per lb equivalent U3O8 as Concentrates			per kg U as Concentrates		
	This Month (Apr 30, 1990)	Last Month (Mar 31, 1990)	12 Months Ago (Apr 30, 1989)	This Month (Apr 30, 1990)	Last Month (Mar 31, 1990)	12 Months Ago (Apr 30, 1989)
Australia (dollar)	11.50	11.63	13.84	29.88	30.24	35.99
Belgium (comm. franc)	299.31	307.34	431.88	778.13	799.02	1,123
Canada (dollar)	10.06	10.26	13.11	26.16	26.66	34.09
EEC (ecu)	7.11	7.28	9.92	18.50	18.93	25.79
Finland (markka)	34.23	35.09	46.04	88.98	91.22	119.70
France (franc)	48.65	49.96	69.84	126.47	129.89	181.57
Italy (lira)	10,630	10,948	15,114	27,637	28,464	39,293
Japan (yen)	1,378	1,369	1,453	3,583	3,559	3,778
Netherlands (guilder)	16.31	16.72	23.27	42.39	43.47	60.50
So. Africa (comm. rand)	22.99	23.20	28.09	59.76	60.31	73.03
Spain (peseta)	917.38	950.67	1,280	2,385	2,472	3,329
Sweden (krona)	52.65	53.65	70.02	136.87	139.47	182.03
Switzerland (franc)	12.59	13.09	18.23	32.72	34.03	47.40
UK (pound)	5.29	5.35	6.51	13.75	13.91	16.91
US (dollar)	8.65	8.75	11.00	22.49	22.75	28.60
West Germany (mark)	14.52	14.85	20.64	37.74	38.60	53.65

[1]Calculated using currency exchange rates published in *The Wall Street Journal* on the last working day of the month.

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CURRENT MARKET DATA

CONVERSION VALUE[1]

Country (currency)	per lb U as UF6			per kg U as UF6		
	This Month (Apr 30, 1990)	Last Month (Mar 31, 1990)	12 Months Ago (Apr 30, 1989)	This Month (Apr 30, 1990)	Last Month (Mar 31, 1990)	12 Months Ago (Apr 30, 1989)
Australia (dollar)	1.93	1.93	2.45	4.25	4.25	5.41
Belgium (comm. franc)	50.17	50.93	76.56	110.61	112.28	168.79
Canada (dollar)	1.69	1.70	2.32	3.72	3.75	5.12
EEC (ecu)	1.19	1.21	1.76	2.63	2.66	3.88
Finland (markka)	5.74	5.81	8.16	12.65	12.82	17.99
France (franc)	8.15	8.28	12.38	17.98	18.25	27.30
Italy (lira)	1,782	1,814	2,679	3,929	4,000	5,907
Japan (yen)	231.00	226.85	257.60	509.27	500.11	567.90
Netherlands (guilder)	2.73	2.77	4.13	6.03	6.11	9.09
So. Africa (comm. rand)	3.85	3.84	4.98	8.50	8.47	10.98
Spain (peseta)	153.78	157.54	226.98	339.03	347.32	500.41
Sweden (krona)	8.83	8.89	12.41	19.46	19.60	27.36
Switzerland (franc)	2.11	2.17	3.23	4.65	4.78	7.13
UK (pound)	0.89	.89	1.15	1.95	1.95	2.54
US (dollar)	1.45	1.45	1.95	3.20	3.20	4.30
West Germany (mark)	2.43	2.46	3.66	5.36	5.42	8.07

SWU VALUE AND UF6 VALUE[1]

Country (currency)	SWU Value at 0.30% Tails Assay			UF6 Value per kg U as UF6		
	This Month (Apr 30, 1990)	Last Month (Mar 31, 1990)	12 Months Ago (Apr 30, 1989)	This Month (Apr 30, 1990)	Last Month (Mar 31, 1990)	12 Months Ago (Apr 30, 1989)
Australia (dollar)	66.45	66.47	84.31	32.43	32.44	38.37
Belgium (comm. franc)	1,730	1,756	2,631	844.29	857.04	1,197
Canada (dollar)	58.17	58.60	79.87	28.39	28.60	36.35
EEC (ecu)	41.13	41.61	60.43	20.07	20.31	27.50
Finland (markka)	197.85	200.50	280.45	96.55	97.84	127.66
France (franc)	281.20	285.50	425.40	137.23	139.33	193.65
Italy (lira)	61,448	62,563	92,058	29,986	30,531	41,907
Japan (yen)	7,966	7,822	8,851	3,887	3,817	4,029
Netherlands (guilder)	94.25	95.55	141.74	45.99	46.63	64.52
So. Africa (comm. rand)	132.87	132.56	171.09	64.84	64.69	77.88
Spain (peseta)	5,303	5,432	7,799	2,588	2,651	3,550
Sweden (krona)	304.32	306.56	426.48	148.51	149.60	194.14
Switzerland (franc)	72.75	74.81	111.06	35.50	36.51	50.55
UK (pound)	30.57	30.57	39.62	14.92	14.92	18.03
US (dollar)	50.00	50.00	67.00	24.40	24.40	30.50
West Germany (mark)	83.91	84.83	125.70	40.95	41.40	57.22

[1]Calculated using currency exchange rates published in *The Wall Street Journal* on the last working day of the month.

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RECENT TRANSACTIONS

URANIUM SALES[1]

NUEXCO Transaction Number	Delivery Period	Approximate Quantity (thousand pounds equivalent U_3O_8)	Approximate Price Range[2] as Percent of Current Exchange Value or UF_6 Value	Buyer	Seller	Remarks
4797	1990	101-300	98-102	Producer	Intermediary	UF_6
4799	1990	50-100	98-102	Producer	Intermediary	
4802	1990	301-600	98-102	Producer	Intermediary	
4803	1990	301-600	98-102	R[3]	Producer	
4804	1990	101-300	98-102	Producer	Intermediary	
4807	1990	301-600	98-102	Utility	Producer	
4809	1990	101-300	98-102	Producer	Intermediary	
4811	1990	601-1,000	93-97	Utility	Intermediary	UF_6
4815	1990	101-300	103-107	Intermediary	Intermediary	
4816	1990	301-600	98-102	Utility	Intermediary	UF_6
4817	1990	50-100	98-102	Utility	Intermediary	UF_6
4818	1990	601-1,000	98-102	Producer	Producer	
4819	1990	301-600	98-102	Producer	Intermediary	UF_6
4822	1991-2000	1,001-3,000	See Remarks	Utility	R[3]	Fixed Price Schedule

[1] Transactions listed are not limited to those in which NUEXCO was involved, but also include others of which NUEXCO is aware. NUEXCO may delay reporting some transactions in order to protect proprietary information.

[2] The range reflects five percentage points (inclusive) per grouping, centered about the middle of the range.

[3] The notation R means that NUEXCO either does not know, or that NUEXCO has restricted that information to protect client or source confidentiality.

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CURRENT MARKET DATA

NATURAL URANIUM LOANS[1]

NUEXCO Transaction Number	Delivery Period	Approximate Quantity (thousand pounds equivalent U_3O_8)	Approximate Price Range[2] as Percent of Current Loan Rate	Borrower	Lender	Remarks
4801	1990	301-600	98-102	Intermediary	Producer	
4806	1990	301-600	113-117	R[3]	Intermediary	
4810	1990	301-600	143-147	Utility	Intermediary	UF_6
4812	1990	301-600	98-102	Producer	Producer	
4813	1990	101-300	R[3]	R[3]	Utility	
4814	1989	101-300	143-147	Producer	Utility	1989 Loan
4820	1990	601-1,000	R[3]	Intermediary	Utility	UF_6

CONVERSION SERVICES SPOT MARKET SALES[1]

NUEXCO Transaction Number	Delivery Period	Approximate Quantity (thousand pounds U as UF_6)	Approximate Price Range[2] as Percent of Current Conversion Value	Buyer	Seller	Remarks
4800	1990	101-300	48-52	Utility	Intermediary	

ENRICHMENT SERVICES SECONDARY MARKET SALES[1]

NUEXCO Transaction Number	Delivery Period	Approximate Quantity[4] (thousand SWUs)	Approximate Price Range[2] as Percent of Current SWU Value[5]	Buyer	Seller	Remarks

No transactions for secondary market enrichment services are reported this month.

[1] Transactions listed are not limited to those in which NUEXCO was involved, but also include others of which NUEXCO is aware. NUEXCO may delay reporting some transactions in order to protect proprietary information.

[2] The range reflects five percentage points (inclusive) per grouping, centered about the middle of the range.

[3] The notation R means that NUEXCO either does not know, or that NUEXCO has restricted that information to protect client or source confidentiality.

[4] If tails assay is unknown or unspecified, NUEXCO's calculation of SWU quantity assumes 0.30 w/o tails assay.

[5] Prices are usually normalized to 0.30% tails assay. When prices and SWU values are expressed as discounts from a reference price (e.g., X dollars less than DOE's USEC base price at time of delivery), the percentage price range is based on the discounted prices, not on the reference price.

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URANIUM SUPPLY
(April 30, 1990)

NUEXCO Project Number	Delivery Period[1] (Thousand Pounds of U_3O_8) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Available for Sale			
ACTIVE			
89-1201*	1,300	2,000 per year	1990-93
90-1027	—	300 per year	1991-2000
Total	**1,300**		
INACTIVE			
89-1076	500	250 per year	1990 on
89-1156	200	—	1990
89-1173	750	—	1990
89-1180	1,000	—	1990
89-1209*	300	—	1990
87-1000	—	600 per year	1991-95
87-1123	—	1,000 per year	1990 on
88-1157	—	1,000 per year	1990 on, UF_6
Total	**2,750**		

* New or revised since last month.

[1] Measured from the date of this Report.
[2] For delivery within one year. This category excludes material deliverable within one year under other than spot or near-term contracts.

Projects removed since last month: 89-1001, 89-7000A, 90-1000A, 90-1051.

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CURRENT MARKET DATA

URANIUM DEMAND
(April 30, 1990)

NUEXCO Project Number	Delivery Period[1] (Thousand Pounds of U_3O_8) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Inquiries to Purchase:			
ACTIVE			
89-1183	400	—	1990
90-1026	100	—	1990
90-1038	800	—	1990
90-1064	650	—	1990, UF_6
90-1077*	1,000	—	1990-91
90-1082*	500	—	1990
90-1085A*	915	—	1990, UF_6e
90-1100A*	45	—	1991, UF_6e
90-1102*	100	—	1990, UF_6
90-1103*	100	—	1990
89-1233	—	160	1991, UF_6
90-1024	—	250 per year	1992-2001
90-1092A*	—	325	1991-92, UF_6e
90-1093A*	—	390	1991-92, UF_6e
90-1098*	—	250 per year	1992-94
Total	**4,610**		
INACTIVE			
89-1067	500	—	1990
89-1175	170	170 per year	1990-91
90-1045A*	405	—	1991, UF_6e
90-1099*	265	—	1990
90-1017*	—	250	1991
Total	**1,340**		

* New or revised since last month.

[1] Measured from the date of this Report.

[2] For delivery within one year. This category excludes material deliverable within one year under other than spot or near-term contracts.

Projects removed since last month: 89-1229, 89-1254, 89-1256, 89-1260, 90-1001, 90-1008, 90-1034, 90-1046, 90-1060, 90-1067, 90-1069, 90-1074.

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LOAN SUPPLY AND DEMAND
(April 30, 1990)

NUEXCO Project Number	Delivery Period [1] (Thousand Pounds of U_3O_8) Within 1 Year	Beyond 1 Year	Remarks
Available for Loan:			
ACTIVE			
88-1182	4,000	—	U_3O_8/UF_6
90-1016	300	—	U_3O_8
90-1033	1,270	—	UF_6
90-1108*	1,000	—	U_3O_8
90-1096*	600	—	U_3O_8
Total	**7,170**		
INACTIVE			
90-1031*	**500**	—	**U_3O_8**
90-1049*	**1,000**	—	**U_3O_8**
Total	**1,500**		
Inquiries to Borrow:			
No inquiries to borrow are reported			

* New or revised since last month.
[1] Measured from the date of this Report.
Projects removed since last month: 90-1036.

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CURRENT MARKET DATA

CONVERSION SUPPLY AND DEMAND
(April 30, 1990)

NUEXCO Project Number	Delivery Period[1] (Thousand Pounds of U as UF_6) Within 3 Years	Beyond 3 Years	Remarks
Available for Sale			
ACTIVE			
89-7002	150	—	
Total	**150**		
INACTIVE			
None reported			
Inquiries to Purchase			
ACTIVE			
90-1101*	500	—	
90-1072*	550	—	
90-1075*	440		
Total	**1,490**		
INACTIVE			
None reported			

* New or revised since last month.
[1] Measured from the date of this Report.
Projects removed since last month: 89-7000C.

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SWU SUPPLY AND DEMAND
(April 30, 1990)

NUEXCO Project Number	Delivery Period[1] (Thousand SWUs) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Available for Sale			
ACTIVE			
90-1073	145	—	1990
Total	**145**		
INACTIVE			
88-1082*	**100**	**—**	**1990**
Total	**100**		
Inquiries to Purchase			
ACTIVE			
90-1071*	150	150 per year	1991-96
90-1079*	1,450	—	1990
90-1080*	90	—	1990
90-1085B*	185	—	1990, UF6e
90-1100B*	15	—	1991, UF6e
88-1061	—	500	1991-95
89-1262	—	120 per year	1996-99
90-1022A	—	235 per year	1996-99
90-1022B	—	900 per year	2000-13
90-1035	—	300 per year	1996-2000
90-1052	—	280 per year	1996-on
90-1076*	—	350 per year	1992-98
90-1092B*	—	150	1991-92, UF6e
90-1093B*	—	200	1991-92, UF6e
90-1094*	—	1,000	1992-2000
Total	**1,890**		
INACTIVE			
90-1045B*	**95**	**—**	**1991, UF6e**
89-1047	**—**	**600**	**1991-95**
Total	**95**		

* New or revised since last month.
[1] Measured from the date of this Report.
[2] For delivery within one year. This category excludes SWU deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: 88-1210, 89-1043, 89-7000B, 90-1000B.

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WASHINGTON FOCUS

Congress continued to work on the budget during April with small breaks to attend Earth Day activities to acknowledge the public's growing environmental conscience. The House Budget Committee once again raised to 100 percent the portion of the Nuclear Regulatory Commission's (NRC) budget to be funded through user fees. However, the Senate Budget Committee authorized continuation of the current 45-percent user fee funding. The full House approved the budget resolution on May 1. The Senate may act sometime in May.

Clean Air Act Amendments

DOE has released new estimates about the impact on enrichment costs of the House version of the Clean Air Act Amendments. The House version is stricter on emission standards, and requires pollution control equipment installation by 1995 instead of 2000, which is the Senate version's deadline. DOE estimates the House amendments will increase the cost of enrichment by $20-$24 per SWU between 1995 and 2000, requiring increased spending in the enrichment program of an additional $600 million over that period.

Uranium Enrichment Reorganization Act

The House Science, Space & Technology Committee staff recently released a draft substitute of HR 2480 (The Uranium Enrichment Reorganization Act). The original bill was introduced last year by Reps. Marilyn Lloyd (D-TN), Bob McEwen (R-OH), and Carroll Hubbard (D-KY) for the Bush Administration. Several hearings were held by the committee last year, but the other two House committees with jurisdiction—Energy & Commerce and Interior & Insular Affairs—have not yet considered the bill. The draft will be the subject of new hearings shortly.

While much of the intent of the Administration's bill remains in the draft, several significant changes have been made by the committee. The corporation created by the bill would remain a wholly-owned government corporation until Congress passes a new law permitting privatization. This corporation would be allowed to enter into joint-venture or equity-participation agreements with private sector companies. In the Senate's version of the bill, the corporation would be required to submit a privatization report to the President for his authorization, while the House's version would permit the corporation to avoid the annual appropriations process, and would allow leases and contracts to be transferred to the corporation. However, these leases and contracts would have to be renegotiated within five years. The corporation would have a five-member managing board of directors, appointed by the President for five-year terms.

At the time of enactment, those DOE personnel employed in what will be the corporation's activities could either transfer to other government positions or could accept employment by the corporation, but then would no longer be employees of the government. All property would be also be transferred to the corporation, including the shutdown gaseous-diffusion plant (GDP) at Oak Ridge, Tennessee. Additionally, the corporation would be able to issue up to $2.5 billion in bonds (not backed by the US government) in order to build new technology (AVLIS), and royalties would be paid on patents obtained from the US government.

The House's version of the bill would allow the corporation maximum management flexibility, including provisions permitting business practices to

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remain proprietary. Under negotiation a requirement for the US utility customers to pay for the decommissioning and decontamination (D&D) of all the GDPs by an added 0.25 mil/KWh fee assessed through the Nuclear Waste Fund. Fifty percent of the total D&D costs for facilities (the Defense Department contribution) would be paid from yearly appropriations and non-US customers would also contribute through the price they pay for SWU. Within two years of enactment, the corporation would be required to prepare a D&D plan for the Oak Ridge GDP, for submission for Congressional review.

DOE Enrichment Program and AVLIS

The Senate Energy & Natural Resources subcommittee on Energy R&D held a hearing on DOE's uranium enrichment program and AVLIS on May 1. Witnesses included William Young, DOE Assistant Secretary for Nuclear Energy; Robert Calabro, Manager, Nuclear Fuels at the Tennessee Valley Authority (TVA); and Gerald Grandey, president of the Uranium Producers of America (UPA).

Senator Wendell Ford (D-KY) from the subcommittee is concerned that DOE has not made enough progress in becoming more competitive or in encouraging the House of Representatives to consider restructuring legislation. He reported that DOE has asked Congress to reprogram $16 million from the FY90 uranium enrichment budget to plutonium production at Savannah River, and for design certification of the advanced light water and liquid metal reactor programs. Sen. Ford is unhappy with this request and has indicated that if DOE continues seeking acceptance of it, he will try to kill its approval. Further, if the enrichment program had a surplus, he said it should be spent on making the enrichment program more competitive, set aside as working capital for the government corporation, or spent on accelerating compliance with environmental regulations. Sen. Ford expressed his fear that AVLIS will become the GCEP (Gas Centrifuge Enrichment Program) of the 1990s. Mr. Young responded he has much greater confidence in AVLIS because the program only needs another $500 million to reach the demonstration stage and it will be demonstrated at almost commercial scale.

The testimonies of Mr. Calabro and Mr. Grandey focused on the commercial market. TVA was asked to testify because it recently requested long-term (post-1996) bids for enrichment services and Sen. Ford was unhappy that TVA was not contracting only with the DOE. Mr Calabro explained that TVA has an obligation to be as competitive and low cost for their rate payers as a private utility. TVA is currently 100-percent committed to DOE for enrichment services through 1995, and has committed 70 percent of its requirements to DOE through 2000. Although TVA asked for bids on the open 30%, it had not signed any long-term contracts and was still considering its options. In his oral testimony, Mr. Grandey asked Congress to consider requiring US utilities to consider other factors in their procurement decisions other than just pricing, such as security of supply. ■

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INDUSTRY BRIEFS

Comanche Peak 1 Receives Operating License

The NRC unanimously approved a full-power operating license for Texas Utilities Electric Company's (TUEC) controversial Comanche Peak 1 on April 16, twelve years after an operating license application was submitted. Concerns over quality assurance caused the delay, but in 1988 TUEC reached an unprecedented settlement with its last opponent, the Citizens Association for Sound Energy (CASE). The president of CASE or their designee, serves for at least five years on the unit's Operating Review Committee. Comanche Peak 1 is expected to reach full power during this summer.

✦✦✦

Crow Butte Project Receives Permit To Mine

The Nebraska Department of Environmental Control has issued a permit to Ferret Exploration Company to proceed with in-situ leach mining at the 2500-acre Crow Butte site near Crawford, Nebraska. Construction of the plant and wellfield is set to begin immediately, with production scheduled for 1991. Ferret first applied for the permit in November 1987.

Japan's Socialist Party Supports Nuclear Energy

In an abrupt policy reversal, Japan's Socialist party (JSP) publicly announced it supports nuclear power —pending the development of an acceptable alternative. The JSP, the government's largest opposition group, recommended that the government :

- allow existing nuclear power plants to operate, but permit no new nuclear plant construction,
- accelerate R&D efforts for alternative energy sources,
- gradually phase out existing nuclear power plants and replace them, when possible, with an improved energy mix.

✦✦✦

Nuclear Power Generated 17% of Electricity in 1989

According to the most recent IAEA estimates, nuclear power generated 17 percent of the world's total electricity in 1989, or approximately 1.85×10^{12} KWh. Nuclear power accounted for more than 50 percent of total electricity generation in Belgium, France, Hungary, South Korea, and Sweden.

South Africa 1st Quarter Production

Although most of South Africa's gold mines reported profit increases due to improved rand prices for gold and more efficient mining, uranium production for the first quarter of 1990 (1,723,000 pounds equivalent U_3O_8) declined a further 7.5%, compared to the fourth quarter of 1989 (1,863,000 pounds). Only Buffelsfontein showed an increase, though it was less than 2% (190,000 vs. 187,000 pounds). The other five mines showed losses in output, particularly Ergo which was down 39% (53,000 vs. 87,000 pounds). Western Areas declined 12% to 120,000 pounds, Freegold dropped 10% to 213,000 pounds, Vaal Reefs slowed by 7% to 948,000 pounds, and Hartebeestfontein was down slightly to 194,000 pounds.

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Malapai Sale Agreement Reached

Société Auxiliare d'Energie (SAE), a subsidiary of Electricité de France (EdF), has reached an agreement in principle to acquire Malapai Resources Co. from the financially-troubled Pinnacle West Capital Corp. Total Minerals Corp., the US subsidiary of Total Mines Nucleaires (France) will operate the acquisition on behalf of the new owners. Malapai's uranium properties include Christensen Ranch and Irigary in Wyoming, and El Mesquite in Texas, which have combined uranium resources of 45 to 50 million pounds equivalent U_3O_8. Malapai holds a number of long-term supply contracts, one of which is with EdF which is committed to purchase 250 thousands pounds annually.

Swedish Nuclear Phase-Out Delay More Likely

In a further concession that Sweden's ambitious nuclear power phase-out program cannot occur without compromising environmental goals, Swedish Prime Minister Carlsson recommended the relaxation of restrictions on carbon dioxide emissions. Appealing to the non-Socialist parties, Carlsson said that unless they allow some increases in carbon dioxide emissions, the nuclear phase-out could not begin in 1995 as they specified. The recommendation came from the four-member Social Democratic committee, formed in 1989 to develop a compromise energy policy. The government is under pressure to issue an energy bill by the end of the year for Parliamentary vote in early 1991.

VEW Signs Reprocessing Contract With BNFL

Vereinigte Elektrizitätswerke Westfalen AG (VEW) became the first West German utility to sign a long-term reprocessing contract with British Nuclear Fuels plc. following the 1989 cancellation of West Germany's Wackersdorf reprocessing plant. Under the contract, reprocessing of 450 metric tons from the Emsland PWR will be performed at BNFL's Thorp, England plant, beginning in 2004. In 1989, the West German government gave approval for foreign reprocessing, after which the West German utilities entered into reprocessing discussions with BNFL and Cogema. No agreements have been reached yet with Cogema, for reprocessing at its La Hague, France plant.

CORRECTION

On page 20 of the previous Monthly Report (April 1990, No. 260) we incorrectly reported; "Uranerz Buys One-Third of *Cogema's* Rabbit Lake Operations." The headline should have read "Uranerz Buys One-Third of *Cameco's* Rabbit Lake Operations." The text of the article correctly stated Cameco as the seller.

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ANALYSIS AND COMMENTARY

THE ECONOMIC FUTURE OF THE US URANIUM INDUSTRY

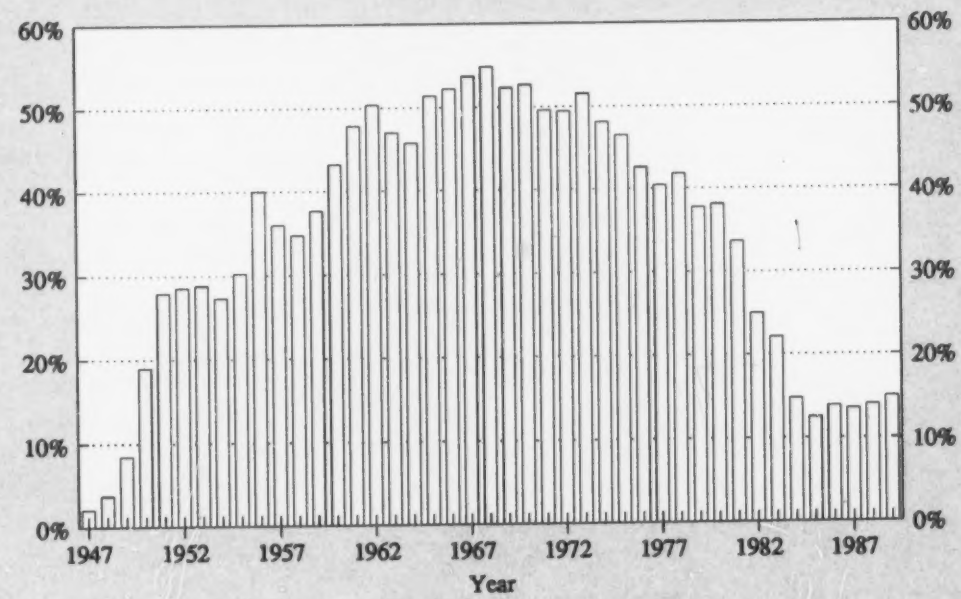
The following is a speech presented by Thomas C. Pool of NUEXCO to a Uranium Workshop sponsored by the US Geological Survey, in Denver, Colorado on March 20, 1990.

In the past decade, the US uranium industry has been reduced from the position of world leader to that of an ordinary supplier. This reduction can be measured in a number of ways: reduced production; reduced exploration activity; and reduced employment. Are there prospects for any increases in the US uranium industry? If so, what, when, and to what degree? This paper addresses some of those questions.

Historical Role

In the 1960s US producers accounted for 50% of the commercial uranium market which, at the time, excluded China and the Soviet bloc nations (**Figure 1**). In the 1970s the US uranium industry spent up to $300 million per year on exploration. In 1979 the industry employed almost 22,000 people. By any of these measures, the US uranium industry is just a shadow of what it once was. So are uranium spot prices as indicated by the NUEXCO Exchange Value. It has dropped from a high of $43.40 per pound U_3O_8 in 1978 to a current value of $8.70 per pound (as of February 28, 1990). The difference is even more pronounced in constant dollars: $72.84 versus $8.70, almost a full order of magnitude.

Figure 1
US SHARE OF COMMERCIAL URANIUM PRODUCTION



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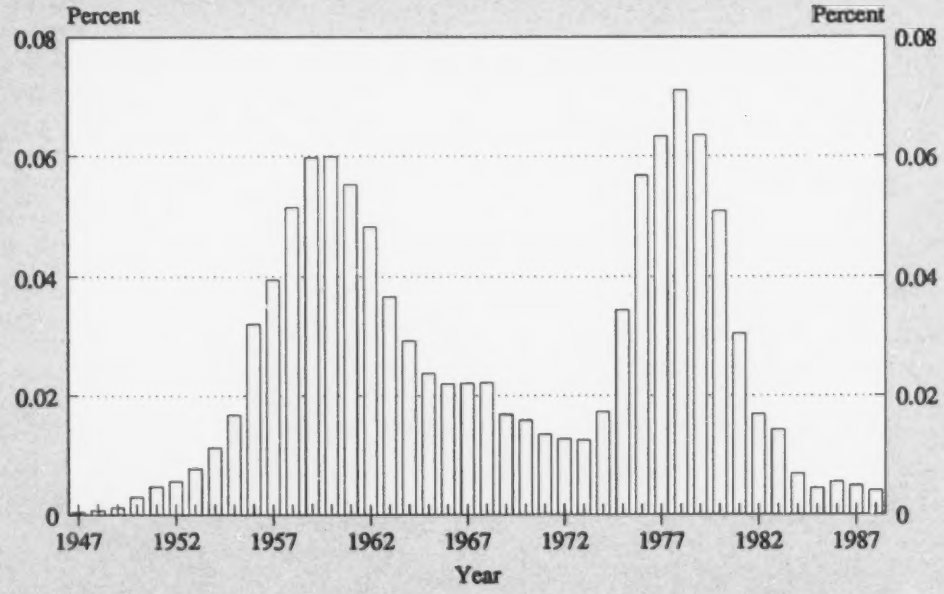
With the drop in both price and production, the US uranium industry has lost any clout it might have had with Washington. In 1978, uranium production in the USA could be valued at 0.07 percent of the US GNP—a significant contribution. Today, however, that share has dropped to about 0.003 percent (**Figure 2**). By contrast, the US coal industry's contribution to the GNP is about one half of one percent, or some 160 times greater than that of the uranium industry.

Let's examine some of the measures of US uranium industry activity on a historical basis (**Figures 3, 4, and 5**). These measures include production, employment, and exploration expenditures. The graphs illustrate a clear correlation of these measures with price. Thus, as market prices increase or decrease, activity in the US uranium industry follows accordingly. The picture is not necessarily the same for some other countries where either production costs are so low as to be unaffected by current price levels, or where most production is committed under long-term contracts at prices in excess of current levels. US uranium producers are generally not blessed with either very low costs or long-term contracts.

Figure 2

VALUE OF US URANIUM PRODUCTION [1]
AS A PERCENTAGE OF US GROSS NATIONAL PRODUCT



[1] Value of production based on production volume times average price for the year. Average price for 1947-1968 based upon average Atomic Energy Commission (AEC) price paid in ore buying program; average price for 1969-present based upon NUEXCO Exchange Value.

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Figure 3

US URANIUM PRODUCTION VS. SPOT PRICE OF URANIUM [1]

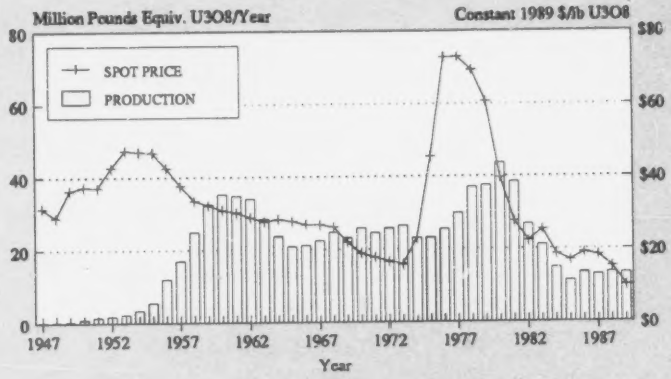


Figure 4

US URANIUM EXPLORATION EXPENDITURES VS. SPOT PRICE OF URANIUM [1]

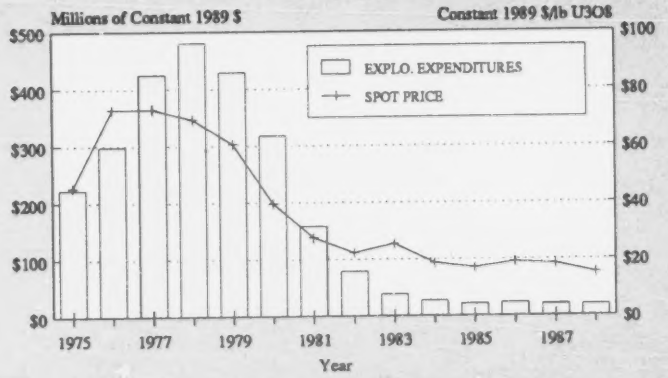
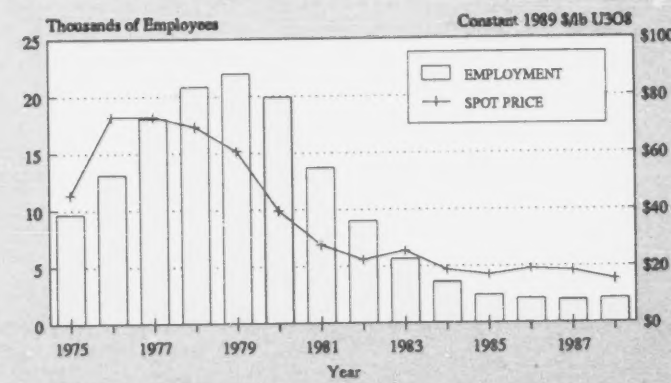


Figure 5

US URANIUM INDUSTRY EMPLOYMENT VS. SPOT PRICE OF URANIUM [1]



[1] Price for 1947-1968 based upon average Atomic Energy Commission (AEC) price paid in ore buying program; average price for 1969-present based upon NUEXCO Exchange Value.

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NUEXCO has examined most US uranium deposits in terms of both available resources and forward marginal costs[1] of production (defined in footnote to Figure 6). This information has been compiled into a cost versus resource curve (**Figure 6**). This curve provides the basis for projecting the future of the US uranium industry.

On a very rough historical basis, annual production from an economic reserve base approximates five percent of that reserve base. Applying this factor to the cost/resource curve, we can project with some confidence that, if prices increased to about $20 per pound, US uranium production could well reach 20 million pounds per year (**Figure 7**). Therefore, it remains only to forecast spot prices and apply that information to the cost/resource curve.

NUEXCO prepares a semi-annual analysis of uranium supply and demand from which future uranium prices are

Figure 6

US URANIUM RESOURCES COST[1] VS. QUANTITY

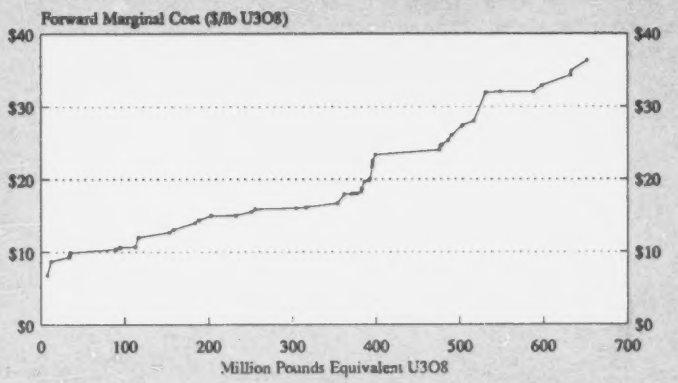
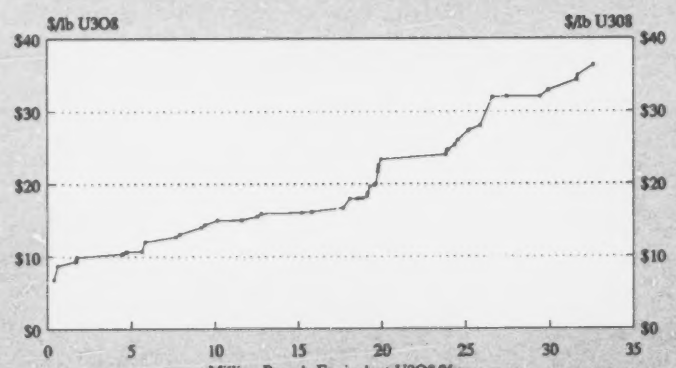


Figure 7

US URANIUM PRODUCTION CAPABILITY VS. SPOT PRICE[2] OF URANIUM



[1] Forward marginal costs are the future costs required to achieve or maintain the desired rate of production. For operating properties, the forward marginal cost is taken as the operating cost, including labor and supplies. For undeveloped properties the forward marginal cost also includes depreciation of the estimated capital cost of development.

[2] The spot price represents NUEXCO's forecast of the average price (in constant 1989 US dollars per pound U_3O_8) at which transactions would occur in the year indicated, for which delivery is made within one year of contract signing.

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projected (**Figure 8**). The October 1989 forecast projects prices to rise moderately through the year 2005.

By factoring the NUEXCO price forecast into the US uranium production capability curve, we can produce a view of future US uranium production (**Figure 9**). From this analysis, US uranium production is expected to show further decreases through 1994, but to rise to modest levels of about 15 million pounds U_3O_8 per year by 1997.

Increased production will be accompanied by increased employment—back to almost 5,000 by the year 2005 (**Figure 10**). Increasing prices will also generate renewed enthusiasm for exploration, and those expenditures could increase from current levels of about $20 million per year to $50 million per year by 1995 (**Figure 11**).

Figure 8
ESTIMATED RANGE AROUND THE NUEXCO URANIUM SPOT PRICE [1] FORECAST [2]

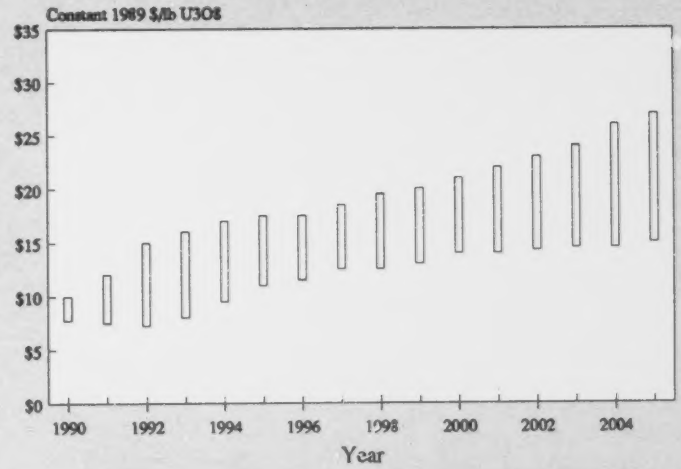
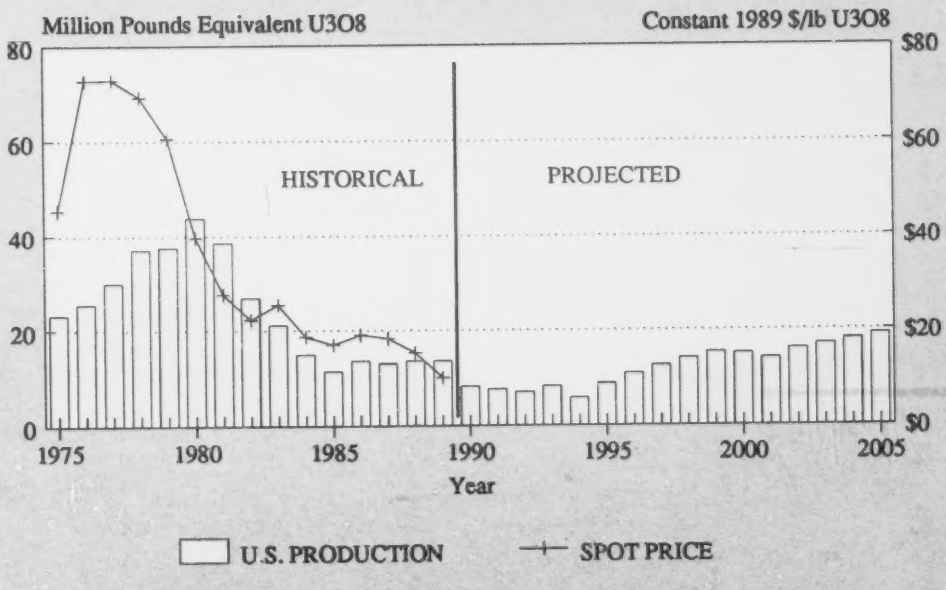


Figure 9
US URANIUM INDUSTRY PRICE [3]– PRODUCTION RELATIONSHIP



[1] The spot price represents NUEXCO's forecast of the average price (in constant 1989 US dollars per pound U_3O_8) at which transactions would occur in the year indicated, for which delivery is made within one year of contract signing.

[2] Forecast of spot price ranges as of October 1989. An updated, detailed spot price forecast is currently available from NUEXCO Information Services.

[3] Price levels shown are the annual average of the NUEXCO Exchange Value for the year indicated.

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Conclusion

The US uranium industry is unlikely ever to regain the level of production and success that it enjoyed in the late 1970s. However, as I have demonstrated here, there is a stable, profitable future, albeit limited, for the industry when uranium spot prices rise.

As the price of uranium increases, production levels will follow, as will employment levels and exploration activity. The US uranium industry must continue to endure this shift of the world market, and prepare to take advantage of the situation when the market eventually turns upward. ■

Figure 10
US URANIUM INDUSTRY
PRICE [1]- EMPLOYMENT RELATIONSHIP

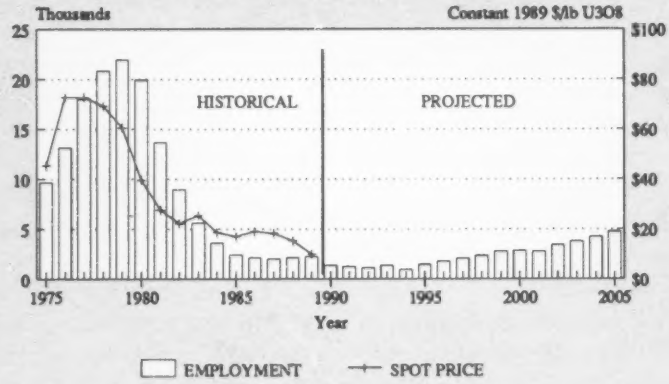
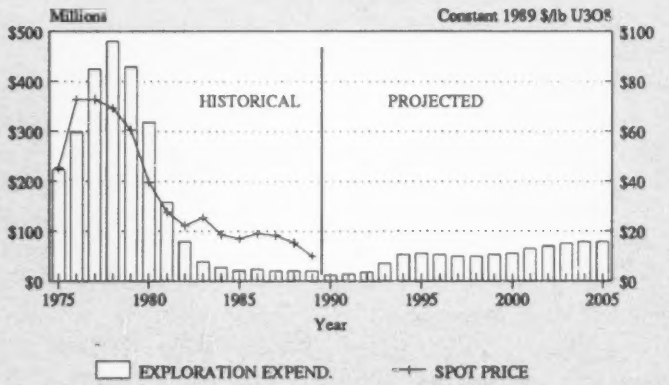


Figure 11
US URANIUM INDUSTRY
PRICE [1]- EXPLORATION RELATIONSHIP



[1] Price levels shown are the annual average of the NUEXCO Exchange Value for the year indicated.

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INTERNATIONAL ATOMIC ENERGY AGENCY

The International Atomic Energy Agency (IAEA) is best known for its nuclear material safeguarding system to ensure non-proliferation of nuclear weapons. Although it is the IAEA's most important responsibility, safeguarding of nuclear material and facilities is just one area in which the agency is involved. It also provides research and technical assistance to members, and is active in nuclear power research, safety, and fuel cycle development.

Background

The IAEA is an intergovernmental agency headquartered in Vienna, Austria. In 1953, US President Dwight D. Eisenhower proposed the idea for an international agency to promote the peaceful use of atomic energy in his "Atoms for Peace" plan. After several years of negotiations, the United Nations (UN) General Assembly officially established the IAEA on July 29, 1957.

The objective of the IAEA is expressly stated in Article II of its statute. "The Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world. It shall ensure, so far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose."

The IAEA General Conference is made up of 113 Member States. It is led by a Board of Governors comprised of delegates from 35 member countries, and an elected Secretariat. The Secretariat consists of a Director-General and five Deputy Directors-General. The Board of Governors meets several times per year, and the General Conference assembles once a year, usually in September. Dr. Hans Blix, former foreign minister of Sweden, was re-elected at last September's conference to his third four-year term as Director-General. The IAEA employs over 2,000 people of nearly 80 nationalities and has an annual budget of well over US$ 200 million.

Role of the IAEA

The IAEA is an autonomous agency with its own statutes. Although it was created through the UN and is expected to operate in accordance with UN purposes and principles, the IAEA is not a specialized agency of the UN and acts independently. The IAEA participates in a number of cooperative ventures with other international and regional agencies. For instance, it works with the World Health Organization, the UN Environment Program, the Nuclear Energy Agency of the Organization for Economic Cooperation and Development (NEA/OECD), and several other agencies on projects assessing nuclear safety and radiation protection.

The agency plays a vital role in international affairs. Its research efforts toward improved reactor technology and better safety, as well as the scientific, agricultural and resource support it provides to developing nations, are very important for advancing nuclear power and world stability. However, the IAEA has its greatest effect on foreign affairs through its nuclear safeguarding program.

Established in the 1960's, the IAEA's safeguards system is the most important factor in the effort to prevent the proliferation of nuclear weapons. The system is the first successful example of inspection of national facilities by an international body. With the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), the Treaty for the Prohibition of Nuclear Weapons in Latin America (Tlatelolco Treaty), the South Pacific Nuclear Free Zone Treaty (Rarotonga Treaty), and other individual agreements, nearly 150 states have safeguards agreements in place, covering approximately 95% of civilian nuclear facilities worldwide.

The NPT is the most widely followed agreement; 138 Non-Nuclear Weapons States subscribe to its safeguards. All five Nuclear Weapons States, as defined by the NPT (USA, USSR, UK, France, and China), have safeguards agreements in place as well. (The USA, USSR, and the UK were early signatories to the NPT. France and China have not signed the NPT, but have reached accord on safeguarding terms.) Recent signatories to the NPT include Kuwait and Qatar in 1989, and Saudi Arabia and Bahrain in 1988. Some of the key countries that have nuclear power capabilities but have not signed the NPT include Argentina, Brazil, Israel, and South Africa. A future goal is to develop a single set of comprehensive safeguards standards for the entire world.

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The future of the NPT will reach a critical point in 1995. Although the treaty will not expire, a vote by NPT signatories will be required to determine whether to extend the treaty indefinitely or only for a certain period of time agreed to by a majority of the signatories. Although the vote is still five years away, some countries have already begun their efforts to influence the outcome.

For example, the USA would like to see the treaty extended indefinitely because of its effectiveness in controlling the spread of nuclear weapons. In contrast, Argentina, which has not signed the NPT, is lobbying to have the NPT dissolved and a new treaty negotiated. It regards the treaty as discriminatory, because it has separate guidelines for Nuclear Weapon States and all other signatories.

Major Activities

The IAEA is regularly involved in three major areas — research and technical assistance; nuclear power, safety, and fuel cycle development; and safeguarding nuclear material and facilities.

Research and Technical Assistance

The IAEA provides development assistance to member countries in numerous fields that can benefit from the use of nuclear science. This is the most diverse area of IAEA involvement. Programs range from food preservation through irradiation, plant breeding and genetics, and soil preservation, to insect and pest control, animal production and health, and energy planning and policy development. The IAEA also provides laboratories to facilitate the exchange of research and information.

For instance, at the International Center for Theoretical Physics in Trieste, Italy, scientists and experts from developing countries conduct research and promote the importance of nuclear energy worldwide. Programs sponsored by the IAEA in these many different areas are very important to lesser developed nations, and the IAEA plays a vital role in providing the resources to assist the technological development of these countries.

Nuclear Power, Safety, and Fuel Cycle Development

The IAEA's primary emphasis in this area is to promote safety in the development of nuclear energy. It supplies funding and information resources to improve nuclear plant performance and develop new reactor technologies by arranging conferences, seminars, and joint research ventures. It offers safety inspection teams and expert groups to assist countries requesting advice on how to improve their nuclear facilities. In addition, the IAEA provides technical assistance and consulting in energy planning, safety, radiation protection, and assists in the development of safe waste management techniques.

Safeguarding Nuclear Material and Facilities

One of the major responsibilities of the IAEA is the safeguarding of all civilian nuclear material and facilities. The NPT does not cover military programs, so the IAEA's safeguarding system only applies to civilian nuclear programs. The agency works to improve current safeguard standards, and to support the NPT and other international safeguards agreements. All signatories to the NPT and other similar agreements must allow inspections by the IAEA. Through these inspections, the agency ensures the peaceful use of nuclear material. At the end of each year, the IAEA reports whether all material under its safeguards remained in peaceful nuclear activity or was otherwise accounted for appropriately.

Organizational Structure

The IAEA is organized into five main departments beneath the Secretariat, each headed by a Deputy Director-General.

Department of Adminstration manages the operations at the IAEA. It is responsible for budgets, finance, external relations, and public information. This department also handles any language needs by members, legal and personnel matters, and general services.

Department of Nuclear Energy and Safety monitors the safety of nuclear fuel cycle facilities. OSART (Operational Safety Review Team) inspects nuclear facilities by invitation to help improve their operational safety. OSART inspections are made by request, and focus on the operational aspects of the facility. The nearly 30 inspections so far have significantly improved the facilities visited, but the future of this review process depends on the cooperation and participation of all members, especially

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those countries with large nuclear programs. The Department of Nuclear Energy and Safety also maintains a computerized database known as the Incident Reporting System (IRS) to compile and analyze all information on any safety incident occurring worldwide.

Department of Research and Isotopes deals primarily with non-nuclear power areas. It allocates the resources of the Technical Assistance and Cooperation Fund to areas such as life sciences, food and agricultural development, the International Center for Theoretical Physics, and the Agency's laboratories.

Department of Safeguards has the most significant impact on the success of the IAEA because it fulfills the Agency's primary objective: the non-proliferation of nuclear weapons. Funded from the regular budget, monies are distributed to this department for actual safeguards operations and inspections, the development and technical support of safeguards, the treatment of safeguards information and evaluation, and training and administrative support.

Department of Technical Cooperation prepares and distributes IAEA publications and oversees the many diverse programs of technical assistance and cooperation.

Regulatory Authority

The safeguards system is the IAEA's primary means of regulation in support of its major objective of non-proliferation. The IAEA requires all countries adhering to safeguards agreements to maintain detailed records of all material and facilities related to civilian nuclear energy, and to ensure their non-military use. All States must satisfy the IAEA that they have complied with all terms of their safeguards agreements, by allowing the IAEA to periodically inspect their records and verify the use of safeguarded material. These inspections are required of all countries that have safeguards agreements in place. The IAEA designates inspectors after consultation with the nation involved, so only mutually acceptable inspectors are selected. These verifications constitute regulatory inspections of material and facilities, not operational reviews like OSART visits.

If a state cannot satisfy the IAEA that all safeguarded material has been used for peaceful purposes, the IAEA will call upon the state to correct the situation immediately, and will report the non-compliance to all IAEA members and to the Security Council and General Assembly of the UN. If the problem is not resolved within a reasonable length of time, the IAEA Board of Governors may suspend or curtail any assistance provided to the non-complying state by the IAEA or any of its members. Additionally, the General Conference of the IAEA may, if recommended by the Board of Governors, suspend the membership of the non-complying state by a two-thirds majority vote.

For example, at the 1989 General Conference last September, South Africa, for the second consecutive year, narrowly avoided suspension for non-compliance violations; the vote was delayed until the next conference in September 1990. Also, Israel has been called upon to comply with a UN resolution to submit all of its nuclear activities to safeguards. Non-Signatories to the NPT or other agreements are not regulated by the IAEA, but international pressure can be exerted through the influence of the UN and by the fact that the NPT prohibits the exchange of nuclear information or material to non-signatory countries unless that material is subject to IAEA safeguards.

Resources

Although the budget of the IAEA has increased significantly since its inception, it is still modest in relation to other comparable international agencies. The budget comprises two major areas—the regular budget and the

Table 1
IAEA 1990 TOTAL BUDGET

US$ 158.3 million	Regular Budget
US$ 45.5 million	Technical Assistance & Cooperation Fund (TACF)
US$ 25.2 million	Estimated Total Extrabudgetary Contributions [1]
US$ 229.0 million	Total Funds

[1] based on 1988 percentages

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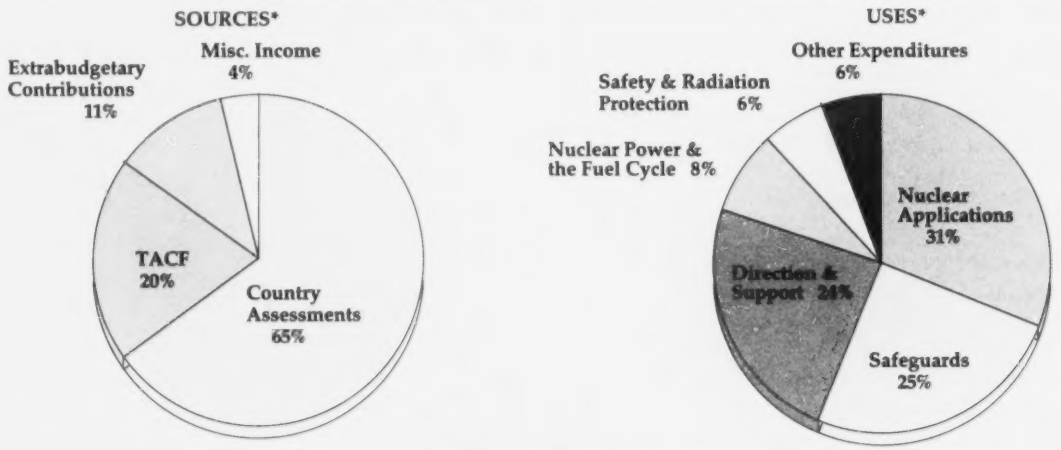
Figure 1
IAEA BUDGET SOURCES AND USES



*based on 1988 values

operational budget. The regular budget is funded by contributions from Member States according to an annual assessment, with miscellaneous income accounting for the small remaining balance. The formula for assessment treats all countries equally, but has special provisions to limit the costs to developing nations. The regular budget is used for ordinary administrative expenses, special panels, experts, conferences, information services, and safeguards expenses. The 1990 regular budget is US$158.3 million, and the Technical Assistance and Cooperation Fund (TACF) budget is US$45.5 million (**Table 1**). Both of these budgets have had zero real growth since 1983.

The operational budget is financed by voluntary contributions from member States and is placed in the TACF. Typically, the donor designates the money to particular programs in areas such as technical assistance, research, or training. In addition to these two major areas of funding, some extrabudgetary contributions are usually made each year to certain programs falling under both the regular and operational budgets. **Figure 1** shows a breakdown of budget sources and uses.

Publications

IAEA's reputation as an authority in nuclear energy is based in part upon its extensive information resources. By the end of 1988, the agency's main database contained over 1.2 million records covering about 90 percent of the world's published nuclear literature. It regularly publishes technical and reference material, as well as documents for public information. Among the journals distributed to the public are the IAEA Newsbrief (ten times per year), the quarterly IAEA Bulletin, the IAEA Yearbook, as well as specific journals regarding topics such as fusion and nuclear safety developments. Uranium: Resources, Production and Demand (commonly referred to as the "Red Book"), is jointly published by the IAEA and the NEA/OECD. It is a widely read reference familiar to many nuclear industry participants. The IAEA also publishes reference material covering nuclear power reactors and research reactors, energy and power forecasts, and fuel cycle trends. A journal listing abstracts of the information contained in its main database is also available.

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Conferences and Seminars

The IAEA also sponsors conferences and seminars to further international communication and cooperation in atomic energy. Some upcoming events include:

Conferences

- *International Symposium on Nuclear Techniques in Exploration and Exploitation of Energy and Mineral Resources*
  Vienna, Austria — June 5-8, 1990
- *International Symposium on Balancing Automation and Human Action in Nuclear Power Plants*
  Munich, West Germany — July 9-13, 1990
- *International Conference on Plasma Physics and Controlled Nuclear Fusion Research*
  Washington, D.C., USA — October 1-6, 1990
- *International Symposium on High-Dose Dosimetry for Radiation Processing*
  Vienna, Austria — November 5-9, 1990

Seminars

- *IAEA/NEA International Seminar on the Use of Unusual Event Reports for Improving Nuclear Power Plant Safety*
  Vienna, Austria — May 14-18, 1990
- *International Seminar on the Costs and Financing of Nuclear Power in Developing Countries*
  Jakarta, Indonesia — September 4-7, 1990
- *Seminar on Spent Fuel Storage–Safety, Engineering and Environmental Aspects*
  Vienna, Austria — October 8-12, 1990
- *Regional Seminar for Europe and the Middle East on Quality Management for Nuclear Power Projects*
  Prague, Czechoslovakia — November 12-16, 1990

Conclusion

The IAEA is the preeminent agency for advancing the peaceful uses of atomic energy and is viewed favorably by most countries. As international political relations improve, and as more countries adopt safeguard measures, the IAEA hopes to enlarge its role in improving the international nuclear industry. The IAEA is dedicated to providing information and resources to further the role of nuclear power as an energy source, and is poised to advance the uses of atomic energy in the 1990's. ■

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Nuclear Industry Calendar

1990	
May 21-23	***1990 Nuclear Power Assembly*** (Washington, DC). Contact American Nuclear Energy Council at 1-202-484-2670.
June 3-7	***30th Annual Conference of the Canadian Nuclear Association and 11th Annual Conference of the Candian Nuclear Society*** (Toronto, Canada). Contact Canadian Nuclear Association, 111 Elizabeth Street, Toronto, Ontario, Canada M5G 1P7.
June 5-8	***International Symposium on Nuclear Techniques in Exploration and Exploitation of Energy and Mineral Resources*** (Moscow, USSR). Contact Conference Service Section, IAEA, P.O. Box 100, A-1400 Vienna, Austria.
June 10-15	***American Nuclear Society Annual Meeting*** (Nashville, Tennessee). Contact American Nuclear Society at 1-708-352-6611.
Sept. 4-7	***International Seminar on the Costs and Financing of Nuclear Power in Developing Countries*** (Jakarta, Indonesia). Contact Conference Service Section, IAEA, P.O. Box 100, A-1400 Vienna, Austria.
Sept. 5-7	***Uranium Institute 15th Annual Symposium*** (London, England). Contact the UI at 44-1-225-0308.
Sept. 16-19	***Uranium Seminar '90*** (Hyatt Regency, San Antonio, Texas), sponsored by the USCEA. Contact the USCEA Conference Office at 1-202-293-0770.
Sept. 23-28	***ENC '90 Congress & Exhibition*** (Lyon, France) organized by the European Nuclear Society in collaboration with the ANS and Foratom. Contact Dr. P. Feuz, European Nuclear Society at 31-21 61 11.
Oct. 14-16	***World Nuclear Fuel Market Annual Meeting*** (Toulouse, France). Contact Donna Cason at 1-404-447-1144.
Nov. 11-14	***Nuclear Energy Forum*** (Washington Hilton, Washington, D.C.), sponsored by the USCEA and ANS. Contact the USCEA Conference Office at 1-202-293-0770, or the ANS Meetings Department at 1-312-352-6611.
1991	
April 14-18	***Third International Conference on Nuclear Fuel Reprocessing & Waste Management*** (Sendai, Japan), sponsored by the Atomic Energy Society of Japan and the Japan Atomic Industrial Forum, co-sponsored by the American Nuclear Society and the European Nuclear Society. Contact the Japan Atomic Industrial Forum at telephone 3-508-2411, or facsimile 3-508-2094.
May	***Second International Conference on Transportation for the Nuclear Industry*** (Bournemouth, England). Contact The Conference Secretary, The Institution of Nuclear Engineers, at 01-698 1500. After May 6, 1990, the number will be 081-698 1500.

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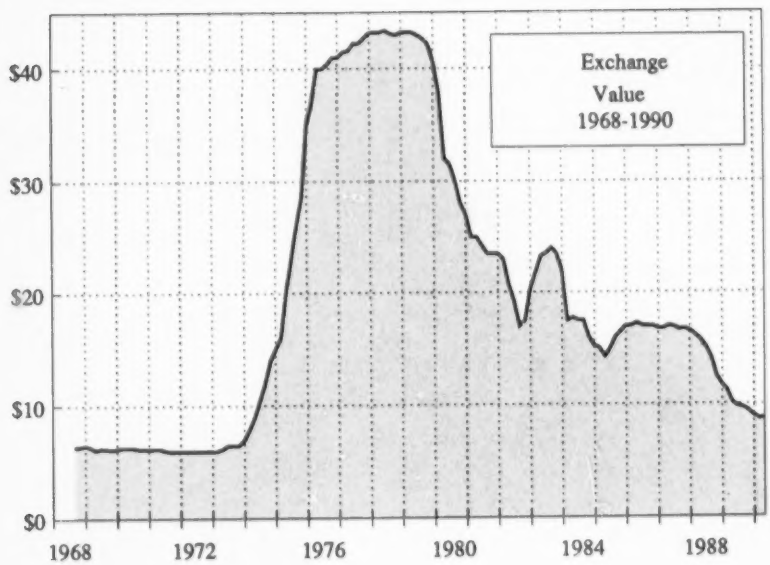
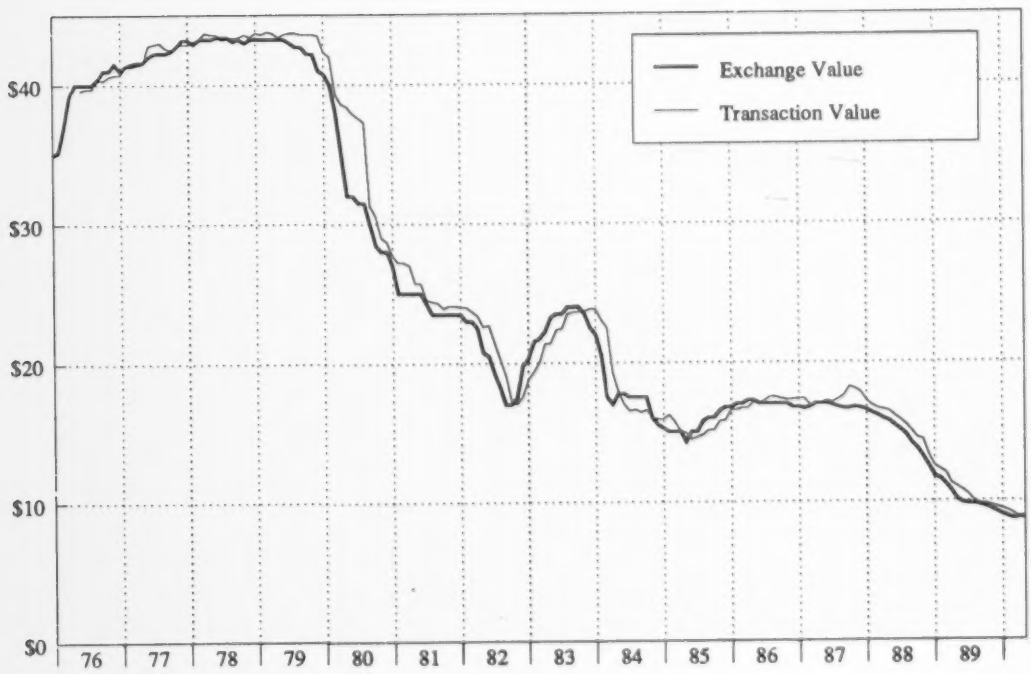
HISTORICAL MARKET DATA

NUEXCO Historical Exchange and Transaction Values

(In US Dollars/Pound U_3O_8)





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HISTORICAL MARKET VALUES

EXCHANGE VALUES

Determined as of the last day of the month indicated ($US/lb U_3O_8)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1968	—	—	—	—	—	—	—	6.35	6.35	6.40	6.45	6.50
1969	—	6.35	6.10	6.10	6.25	6.25	6.20	6.20	6.15	6.15	6.15	6.20
1970	6.30	6.30	6.30	6.30	6.30	6.30	6.30	6.20	6.15	6.15	6.15	6.15
1971	6.20	6.20	6.20	6.20	6.15	6.05	6.00	5.95	5.95	5.95	5.95	5.95
1972	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95
1973	5.95	6.00	6.10	6.20	6.45	6.50	6.50	6.50	6.50	6.50	6.75	7.00
1974	7.70	7.90	8.00	9.00	9.50	10.50	11.50	12.00	12.50	14.00	14.75	15.00
1975	16.00	16.00	18.00	20.00	21.00	23.00	24.70	26.00	26.00	28.50	30.00	35.00
1976	35.20	37.00	39.25	40.00	40.00	40.00	40.00	40.40	41.00	41.00	41.50	41.00
1977	41.35	41.50	41.60	41.60	42.00	42.25	42.25	42.25	42.40	42.75	43.20	43.20
1978	42.90	43.25	43.25	43.25	43.40	43.40	43.40	43.10	43.25	43.00	43.25	43.25
1979	43.25	43.25	43.25	43.25	43.25	43.00	42.70	42.70	42.20	42.20	41.00	40.75
1980	40.00	38.00	35.00	32.00	32.00	31.50	31.50	30.00	28.50	28.00	28.00	27.00
1981	25.00	25.00	25.00	25.00	25.00	24.25	23.50	23.50	23.50	23.50	23.50	23.50
1982	23.00	23.00	22.50	20.75	20.50	19.25	18.25	17.00	17.00	17.50	19.75	20.25
1983	21.50	21.75	22.25	23.25	23.50	23.50	24.00	24.00	24.00	23.50	22.50	22.00
1984	20.50	17.50	17.00	17.75	17.75	17.50	17.50	17.50	17.50	16.00	15.50	15.25
1985	15.00	15.00	15.00	14.25	15.00	15.00	15.75	16.00	16.00	16.50	16.75	17.00
1986	17.00	17.00	17.25	17.25	17.00	17.00	17.00	17.00	17.00	17.00	16.75	16.75
1987	16.65	16.75	17.00	17.00	17.00	16.90	16.75	16.65	16.65	16.75	16.65	16.55
1988	16.30	16.15	15.90	15.75	15.40	15.10	14.75	14.15	13.75	13.15	12.50	11.75
1989	11.60	11.20	10.70	10.10	9.85	9.80	9.80	9.70	9.60	9.40	9.20	9.00
1990	8.85	8.70	8.80	**8.80**								

US PREMIUM (Relative to the Exchange Value)

Determined as of the last day of the month indicated ($US/lb U_3O_8)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	—	—	—	—	—	—	—	—	—	—	0.65	0.75
1987	0.85	1.00	1.50	1.50	0.90	0.60	2.50	2.35	2.10	1.65	0.85	0.65
1988	0.70	0.50	0.15	0.25	0.60	0.00	0.00	0.00	0.00	0.00	**Discontinued**	

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HISTORICAL MARKET DATA

UF6 VALUES

Determined as of the last day of the month indicated ($US/kg U as UF_6)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1985	—	—	—	40.50	42.50	42.50	44.00	44.50	44.50	46.00	46.00	47.00
1986	47.00	48.00	48.00	48.50	48.25	48.25	48.25	48.00	48.00	48.00	48.00	47.75
1987	47.75	48.00	48.00	48.00	47.75	47.75	47.50	47.00	46.75	47.00	47.00	47.00
1988	46.50	46.00	45.50	45.25	44.75	44.00	42.75	41.00	40.75	39.00	37.50	35.50
1989	34.75	34.00	33.00	30.50	30.25	30.25	30.00	29.75	29.75	28.25	27.75	26.50
1990	25.90	25.25	24.40	**24.40**								

US UF6 PREMIUM (Relative to the UF6 Value)

Determined as of the last day of the month indicated ($US/kg U as UF_6)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	—	—	—	—	—	—	—	—	—	—	2.50	2.50
1987	2.50	2.50	3.50	3.00	2.25	1.75	6.50	6.00	4.25	3.10	2.25	2.00
1988	1.25	1.25	0.50	0.50	1.00	0.00	0.00	0.00	0.00	0.00	**Discontinued**	

TRANSACTION VALUES

Determined as of the last day of the month indicated ($US/lb U_3O_8)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	—	—	—	—	39.60	39.70	39.70	40.40	40.30	40.60	40.70	40.70
1977	41.30	41.30	41.40	41.50	42.80	42.90	43.00	42.60	42.50	42.80	42.90	42.90
1978	43.10	43.30	43.70	43.60	43.60	43.20	43.30	43.40	43.40	43.60	43.40	43.70
1979	43.60	43.80	43.70	43.40	43.60	43.70	43.70	43.60	43.60	43.60	43.50	42.30
1980	42.00	39.30	38.60	38.40	37.90	37.60	37.30	31.60	30.60	29.00	28.70	27.70
1981	27.20	27.20	27.00	25.70	25.70	24.50	24.40	24.30	23.90	24.10	24.10	24.00
1982	24.00	23.70	23.40	22.60	22.70	21.50	20.30	19.10	17.30	17.00	17.55	18.80
1983	19.35	20.00	21.35	21.40	22.35	22.45	23.50	23.60	23.65	23.65	23.85	23.85
1984	23.05	22.50	19.25	17.90	17.00	16.50	16.60	16.40	16.55	16.05	15.90	15.90
1985	16.20	15.70	15.05	14.90	14.45	14.60	14.75	15.10	15.10	15.75	15.80	16.55
1986	16.55	16.70	16.70	17.10	17.15	17.20	17.50	17.45	17.35	17.25	17.30	17.35
1987	17.35	16.90	16.95	17.00	17.20	17.10	17.30	17.55	18.20	18.05	17.80	17.20
1988	16.85	16.65	16.55	16.45	16.10	15.80	15.45	15.00	14.50	14.40	13.30	12.50
1989	12.25	12.00	11.25	11.00	10.75	10.45	9.95	9.80	9.80	9.65	9.55	9.40
1990	9.25	9.05	8.75	**8.65**								

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LOAN RATES

Determined as of the last day of the month indicated (Percent per Annum)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1968	—	—	—	—	—	—	—	4.00	4.00	4.00	4.00	4.00
1969	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00	6.00	6.00	6.00	6.00
1970	6.00	6.20	6.40	6.50	6.50	6.50	6.50	5.00	6.50	6.00	5.50	5.50
1971	5.00	4.75	4.75	4.75	5.00	5.25	5.25	5.25	5.25	5.25	4.50	4.50
1972	4.00	4.00	4.00	4.50	4.50	4.50	5.00	5.00	5.00	5.00	5.00	5.00
1973	5.50	5.50	5.75	5.75	6.00	6.25	7.00	7.00	7.00	7.00	7.50	8.00
1974	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
1975	8.00	7.00	7.00	7.00	7.00	6.50	6.50	6.50	6.50	6.50	6.50	6.50
1976	6.50	6.50	6.50	6.50	*	*	*	*	*	*	*	*
1977	*	*	*	*	6.50	6.50	6.50	6.75	7.25	7.25	7.25	7.25
1978	7.25	7.00	7.00	7.00	7.00	7.50	7.75	7.75	7.75	7.00	7.00	7.00
1979	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1980	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1981	7.00	7.00	7.00	7.00	7.00	5.50	5.50	5.50	5.50	6.00	6.00	6.00
1982	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1983	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1984	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1985	6.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1986	5.00	5.00	5.00	5.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
1987	3.00	3.00	3.00	3.00	3.00	3.00	3.00	4.00	4.00	4.00	3.50	3.50
1988	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1989	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1990	3.50	3.50	3.50	**3.50**								

* Float with Prime Rate

CONVERSION VALUES

Determined as of the last day of the month indicated ($US/lb U as UF_6)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1981	1.20	1.20	1.20	1.40	1.15	1.15	1.15	1.10	1.10	1.10	1.20	1.20
1982	1.20	1.20	1.20	1.20	1.00	1.00	1.00	0.90	1.10	1.60	1.45	1.45
1983	1.20	1.40	1.40	1.20	1.20	1.20	1.10	1.10	1.00	0.60	0.60	0.60
1984	0.60	0.30	0.80	0.80	0.80	0.00	0.00	0.80	1.00	1.00	0.80	0.80
1985	1.00	1.00	1.00	1.50	1.50	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1986	1.60	1.80	1.90	1.80	1.80	1.80	1.80	1.90	1.90	1.90	1.80	1.80
1987	1.80	1.80	1.80	1.80	1.80	1.80	1.90	1.90	1.90	1.90	1.90	1.90
1988	1.90	1.80	1.80	1.80	1.80	1.80	1.85	1.95	1.95	1.95	1.95	1.95
1989	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.90	1.90	1.80	1.75	1.65
1990	1.50	1.50	1.45	**1.45**								

SWU VALUES

Determined as of the last day of the month indicated ($US per SWU)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	80	80	80	80	75	78	78	78	78	78	80	80
1987	80	80	77	77	75	73	75	75	73	69	73	73
1988	73	73	70	68	68	68	68	65	65	65	65	65
1989	65	67	67	67	66	66	66	65	63	59	57	54
1990	54	50	50	**50**								

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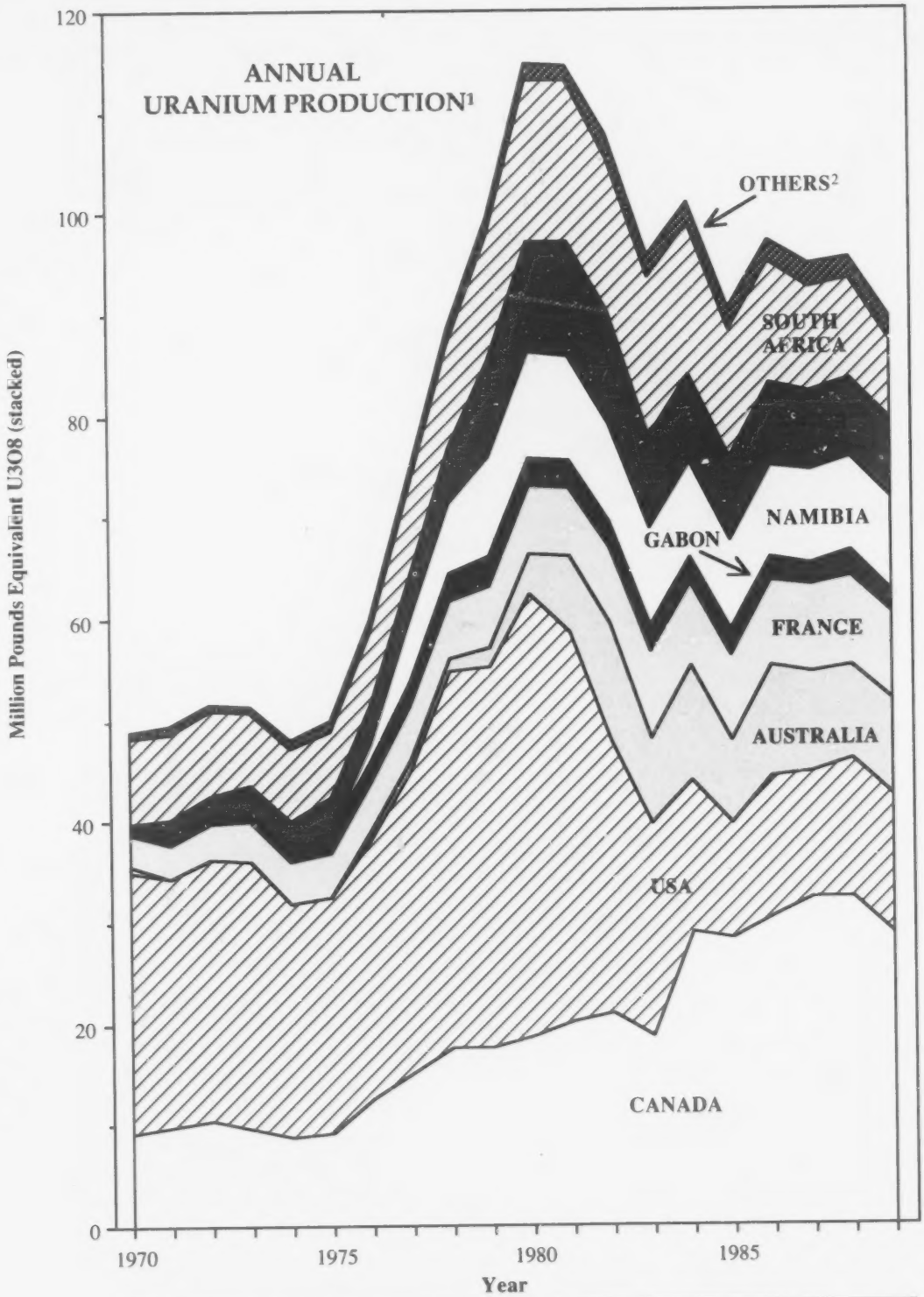
HISTORICAL MARKET DATA



[1] Estimated world production in 1989 totalled 89.6 million pounds (Australia—9.5; Canada—28.7; France—8.5; Gabon—2.2; Namibia—9.2; Niger—7.7; South Africa—7.7; USA—13.7; Others[2]—2.3).

[2] **Others** includes: Argentina, Belgium, Brazil, India, Pakistan, Portugal, Spain, West Germany and Yugoslavia

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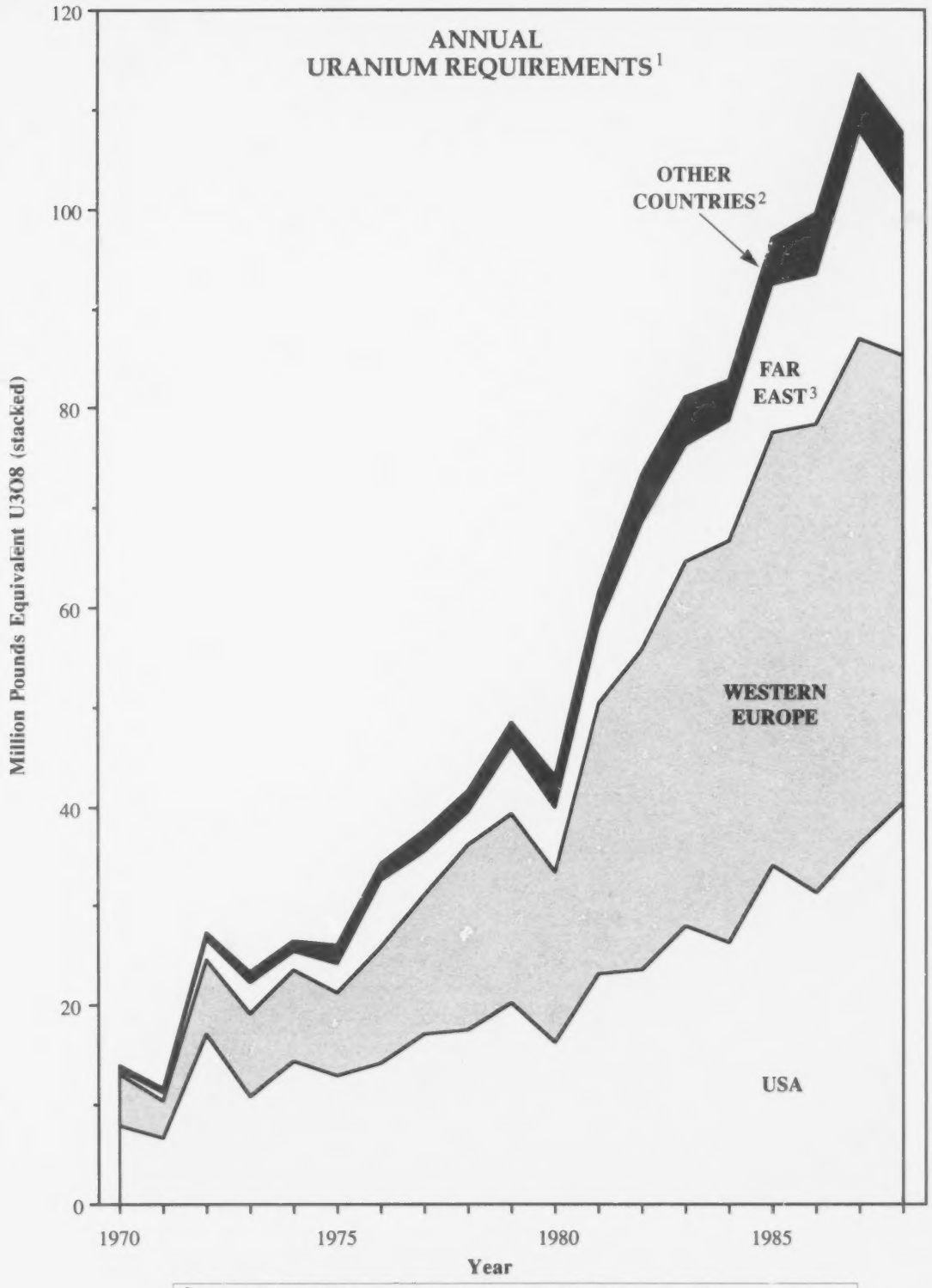

[1] Calculated by NUEXCO based on actual completion dates and operating performance, and NUEXCO's estimate of enriching tails assays.

[2] **Other Countries** include: Argentina, Brazil, Canada, India, Mexico, Pakistan and South Africa.

[3] Does not include Peoples Republic of China.

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GOVERNMENT STATISTICS

AUSTRALIA

		Consumer Price Index[1] (1980/1981 = 100)	Price Index of Materials Used in Manufacturing Industry — All Groups[2] (1984/1985 = 100)	Average Weekly Ordinary Time Earnings — Adult Males — Australia (Australian dollars)[6]	Award Rates of Pay Indexes Australia - Adult Males In Mining Wage Earners, Weekly Rates[3] (June 1985=100)
1980	Avg.	95.8	83.1	—	140.8[5]
1981	Avg.	105.0	85.9	—	154.1[5]
1982	Avg.	116.7	89.0	—	174.9[5]
1983	Avg.	128.5	96.9	—	181.9[5]
1984	Avg.	133.6	98.0	—	194.4[5]
1985	Avg.	142.6	107.3	—	103.7
1986	Avg.	155.5	101.5	—	106.1
1987	Avg.	168.7	108.9	465.88	112.3
1988	Avg.	180.9	111.8	496.90	115.2
Jan	1989	—	110.6	—	122.2
Feb	1989	—	111.2	521.90	122.2
Mar	1989	188.0	114.9	—	123.1
Apr	1989	—	117.5	—	123.2
May	1989	—	118.6	530.40	123.7
June	1989	192.6	119.9	—	124.7
July	1989	—	120.1	—	126.2
Aug	1989	—	119.2	539.30	126.2
Sept	1989	197.0	117.7	—	126.3
Oct	1989	—	117.8	—	126.5
Nov	1989	—	118.0	547.20	126.8
Dec	1989	—	118.2	—	126.8
Jan	1990	—	119.2	—	126.8
Feb	1990	—	120.8	—	127.2

P = Preliminary R = Revised since last month

[1]Weighted average of six State capital cities (1975 to 1980), and eight capital cities from 1981 (Base: Financial year July 1980 to June 1981 =100.0). Figures shown at end of quarter represent quarterly average.
[2]Australian Bureau of Statistics, Canberra: "Price Index of Materials Used in Manufacturing Industry" (Catalogue No. 6411.0).
[3]Australian Bureau of Statistics, Canberra: "Award Rates of Pay Indexes, Australia" (Catalogue No. 6312.0). Figures for the latest fourteen months shown are subject to revision.
[4]Monthly data for the period 1967 to 1986 appear in Report 233.
[5]Base: June 1976 = 100.
[6]Australian Bureau of Statistics, Canberra: "Average Weekly Earnings, States & Australia" (Catalogue No. 6302.0).

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CANADA

		Industrial Products Price Index: All Commodities[1] (1981 = 100)	Consumer Price Index: All Items (1981 = 100)	Wage-earner Data: Average Hourly Earnings (C$)[2] Uranium Mines (SIC 057)	Metal Mines (SIC 051-059)	Mines, Quarries and Oil Wells[3] (SIC 051-099)	Metal Rolling, Casting and Extruding (SIC 298)	Chemicals and Chemical Products Industries (SIC 372-379)
1980	Avg.	90.7	88.9	—	—	—	—	—
1981	Avg.	100.0	100.0	—	—	—	—	—
1982	Avg.	106.7	110.8	—	—	—	—	—
1983	Avg.	110.4	117.2	17.22	—	14.18	10.67	11.10
1984	Avg.	115.4	122.3	17.89	—	14.97	11.11	11.68
1985	Avg.	118.6	127.2	18.53	16.48	15.56	11.85	12.12
1986	Avg.	119.6	132.4	19.38	16.70	15.76	12.28	12.58
1987	Avg.	122.7	138.2	20.12	17.15	16.11	12.58	13.20
1988	Avg.	128.1	143.8	20.91	18.51	16.95	13.17	13.77
Jan	1989	130.7	146.8	21.22	19.45	18.14	13.75	13.82
Feb	1989	130.8	147.8	22.05	19.51	18.26	13.79	13.89
Mar	1989	131.3	148.5	21.90	19.65	18.35	13.62	14.10
Apr	1989	131.3	149.0	22.37	19.80	18.40	13.57	14.16
May	1989	131.4	150.5	21.89	20.02	18.17	13.76	14.27
June	1989	131.5	151.3	21.89	20.02	18.17	13.76	13.22
July	1989	131.4	152.3	21.67	19.60	17.96	13.57	12.98
Aug	1989	131.3	152.4	20.97	19.76	18.24	13.52	14.30
Sept	1989	131.0	152.6	21.97	20.61	18.73	13.68	14.83
Oct	1989	130.8	153.2	22.26	20.71	18.74	13.99	14.77
Nov	1989	130.6	153.7	22.60	20.64	18.78	13.93	14.75
Dec	1989	130.2	153.6	22.80	20.50	18.93	13.62	14.77
Jan	1990	130.4	154.9	21.88	20.39R	19.03R	13.99	14.78R
Feb	1990	131.3	155.8	22.51P	20.56P	19.09P	14.49P	15.04P
Mar	1990	131.6	156.3	—	—	—	—	—

P = Preliminary R = Revised since last month

[1]Statistics Canada, Prices Division, Ottawa: "Industry Price Indexes" (Catalogue 62-011). Indexes for the most recent six months shown are subject to revision. This category was formerly known as "Manufacturing." Monthly data for the period 1967 to 1986 is found in Report 233.
[2]Statistics Canada, Labour Division, Employment and Payrolls Section, Ottawa: "Employment, Earnings and Hours." Monthly data for the period 1983 to 1986 is found in Report 233.
[3]Reports 175 through 185 list this series title incorrectly as "Metal Mining, Including Milling (SIC 050-099)."

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SOUTH AFRICA

		Average Declared Working Costs per Metric Ton of Gold Ore Milled (Rand)[1]	Tonnage-Weighted Index of Average Working Costs per Metric Ton of Gold Ore Milled (March 1982 = 100)[2]	Consumer Price Index[3] (1985 = 100)	Production Price Index All Groups[4] (1985 = 100)	Total Employment in Mining and Quarrying[5]	Total Salaries and Wages in Mining and Quarrying (1,000 Rand)[5]
1980	Avg.	35.53	—	51.9	55.2	709,042	2,237,689
1981	Avg.	41.89	—	59.8	62.7	722,918	2,756,928
1982	Avg.	47.25	104.2	68.6	71.4	702,041	3,181,584
1983	Avg.	51.88	115.0	77.1	79.0	700,901	3,563,282
1984	Avg.	58.95	130.3	86.0	85.6	711,511	4,134,390
1985	Avg.	68.76	151.6	100.0	100.0	724,587	4,778,612
1986	Avg.	80.22	177.9	118.6	119.5	756,637	5,767,950
1987	Avg.	95.01	223.1	137.7	136.2	751,864	6,911,395
1988	Avg.	106.69	241.1	155.4	154.1	705,355	7,774,054
Jan	1989	—	—	166.8	165.5	714,593	704,320
Feb	1989	—	—	168.2	168.5	696,329	669,983
Mar	1989	112.29	262.8	170.9	171.1	702,746	695,843
Apr	1989	—	—	173.1	173.8	658,677	634,344
May	1989	—	—	175.9	176.4	706,056	721,263
June	1989	113.76	267.0	177.7	177.1	706,810	720,586
July	1989	—	—	179.3	178.8	711,648	775,002
Aug	1989	—	—	181.8	180.7	703,812	793,475
Sept	1989	119.76	280.2	183.4	181.7	708,222	780,723
Oct	1989	—	—	185.1	183.9	689,017	—
Nov	1989	—	—	187.0	185.6	—	—
Dec	1989	120.79	282.0	189.4	187.2	—	—
Jan	1990	—	—	192.0	188.8	—	—
Feb	1990	—	—	193.3	190.3	—	—
Mar	1990	—	—	196.4	—	—	—

P = Preliminary R = Revised since last month

[1]Chamber of Mines of South Africa, Johannesburg: "Analysis of Working Results," published quarterly. Historical Data by month appears in Report 236.
[2]Page 16 of Report 178 contains description and calculation of index, and page 24 of Report 178 lists figures for 1982.
[3]Central Statistical Service, Pretoria: All income groups-weighted average, Historical Data by month appears in Report 236.
[4]Central Statistical Service, Pretoria: All commodities for consumption in South Africa.
[5]Central Statistical Service, Pretoria: Historical Data by month appears in Report 236.

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UNITED STATES

		Producer Price Index[1]		Consumer Price	GNP Implicit Price	Gross Average Hourly Earnings of Production or Non-supervisory Workers (US$)[4]			
		Industrial Commodities (1982 = 100)	All Commodities (1982 = 100)	Index[2] (1982-1984 = 100)	Deflator[3] (1982 = 100)	Metal Mining (SIC 10)	Primary Non-ferrous Metals (SIC 333)	Chemicals and Allied Products (SIC 28)	Electric and Electronic Equipment (SIC 36)
1980	Avg.	88.0	89.8	82.4	85.7	10.26	10.63	8.30	6.94
1981	Avg.	97.4	98.0	90.9	94.0	11.55	11.98	9.12	7.62
1982	Avg.	100.0	100.0	96.5	100.0	12.31	12.93	9.96	8.21
1983	Avg.	101.1	101.3	99.6	103.9	12.58	13.43	10.58	8.67
1984	Avg.	103.3	103.7	103.9	107.7	13.05	13.43	11.07	9.04
1985	Avg.	103.7	103.2	107.6	110.9	13.38	13.74	11.56	9.46
1986	Avg.	100.0	100.2	109.6	113.9	12.46	13.48	11.98	9.65
1987	Avg.	102.6	102.8	113.6	117.7	12.52	12.98	12.37	9.88
1988	Avg.	106.3	106.9	118.3	121.7	13.09	13.22	12.67	10.13
Jan	1989	109.4	110.5	121.1	—	13.80	13.49	12.85	10.27
Feb	1989	110.1	110.8	121.6	—	13.66	13.48	12.88	10.26
Mar	1989	110.5	111.5	122.3	125.4	13.71	13.51	12.91	10.30
Apr	1989	111.8	112.3	123.1	—	13.68	13.65	12.92	10.31
May	1989	112.1	113.2	123.8	—	13.60	13.57	12.98	10.33
June	1989	112.4	112.9	124.1	126.0	13.62	13.66	12.98	10.37
July	1989	112.2	112.8	124.4	—	13.70	13.75	13.12	10.41
Aug	1989	111.4	112.0	124.6	—	13.64	13.72	13.08	10.40
Sept	1989	111.9	112.4	125.0	126.8	13.70	13.99	13.18	10.47
Oct	1989	112.4	112.8	125.6	—	13.76	13.94	13.25	10.43
Nov	1989	112.2	112.7	125.9	—	13.69	14.12	13.26	10.47
Dec	1989	112.3	113.0	126.1	128.0	13.51	14.16	13.31	10.52
Jan	1990	114.2	114.9	127.4	—	13.75R	13.95R	13.31R	10.50R
Feb	1990	113.6	114.4	128.0	—	13.75P	14.00P	13.21R	10.53R
Mar	1990	113.2	114.2	128.7	129.7	—	—	13.28P	10.53P

P = Preliminary R = Revised since last month

[1]US Bureau of Labor Statistics, Washington, D.C.: "Producer Prices and Price Indexes," (formerly "Wholesale Prices and Price Indexes"). Producer Price Indexes are revised four months after they are first released to reflect the availability of late reports and corrections by respondents. Historical data is presented in Report 233.

[2]US Bureau of Labor Statistics, Washington, D.C.: Consumer Price Index for All Urban Consumers, US City Average, All Items. Historical data is presented in Report 233.

[3]US Department of Commerce, Washington, D.C.: Bureau of Economic Analysis, National Income and Wealth Division: "Survey of Current Business." The GNP Implicit Price Deflator is published quarterly, and seasonally adjusted. Historical data is presented in Report 233.

[4]US Bureau of Labor Statistics, Washington, D.C.: "Employment and Earnings." All data based on 1972 revision of SIC Manual. Historical data is presented in Report 233.

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US URANIUM MARKETING ACTIVITIES STATISTICS
(Compiled from data published by the US Energy Information Administration) [1]

Year	Total Production (million pounds U_3O_8)	Deliveries to Domestic Utilities From US Suppliers[2] (million pounds U_3O_8)	Average Price of Delivered Uranium[2] ($/lb. U_3O_8)	Quantity of Uranium Imported[3] (million pounds U_3O_8)	Average Price of Imported Uranium ($/lb. U_3O_8)	Quantity of Uranium Exported (million pounds U_3O_8)
1976	25.5	27.6	$16.10	3.6	n/a	1.2
1977	29.9	27.8	$19.75	5.6	n/a	4.0
1978	37.0	31.6	$21.60	5.2	n/a	6.8
1979	37.5	33.0	$23.85	3.0	n/a	6.2
1980	43.7	35.0	$28.15	3.6	$43.10	5.8
1981	38.5	32.6	$34.65	6.6	$32.90	4.4
1982	26.9	23.5	$38.37	17.1	$25.19	6.2
1983	21.2	24.2	$38.21	8.2	$26.16	3.3
1984	14.9	22.5	$32.65	12.5	$21.86	2.2
1985	11.3	21.7	$31.43	11.7	$20.08	5.3
1986	13.5	18.9	$30.01	13.5	$20.07	1.6
1987	13.0	20.8	$27.37	14.8	$19.14	1.0
1988	13.1	17.6	$25.65	15.8	$19.03	3.3

[1] Sources: 1976-1983: US Department of Energy/Energy Information Administration, *Survey of United States Marketing Activity*
1984-1988: Energy Information Administration, *Uranium Industry Annual*
[2] Data for 1976-1981 includes both domestic utilities and agents
[3] Includes imports by domestic utilities and domestic suppliers

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VOLUME AND PRICE OF URANIUM DELIVERIES TO THE EUROPEAN COMMUNITY[1]
(Compiled from data published by the Euratom Supply Agency)

Year	Volume of Deliveries to the EC[2] (in MTU)	Percentage of Deliveries Made Under Spot Contracts	Medium or Long-Term Contracts[3,4]		Spot Contracts[3,4]	
			Average Price in ECU per pound U_3O_8	Average Price in US Dollars per pound U_3O_8	Average Price in ECU per pound U_3O_8	Average Price in US Dollars per pound U_3O_8
1977	n/a	n/a	n/a	n/a	n/a	$41.00
1978	n/a	n/a	n/a	n/a	n/a	$43.00
1979	10,000	n/a	n/a	n/a	n/a	$44.50
1980	8,600	n/a	n/a	$36.00	n/a	$35.00
1981	13,000	less than 10	n/a	$33.25	n/a	$28.00
1982	12,500	less than 10	ECU 32.25	$32.00	ECU 24.25	$24.00
1983	13,500	less than 10	ECU 34.75	$31.00	ECU 26.00	$23.25
1984	11,000	less than 10	ECU 37.75	$29.75	ECU 24.50	$19.25
1985	11,000	11.5	ECU 38.00	$29.00	ECU 19.50	$15.00
1986	12,000	9.5	ECU 31.50	$31.00	ECU 18.00	$17.75
1987	14,000	17.0	ECU 28.25	$32.50	ECU 15.00	$17.25
1988	12,500	4.5	ECU 26.92	$31.82	ECU 13.65R	$16.13R

R = Revised

[1]The twelve European Community member nations are Belgium, Denmark, France, the Federal Republic of Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, and the United Kingdom; prior to January 1986, Spain and Portugal were not members of the EEC.

[2]The only deliveries taken into account are those made to final users, namely the electric utilities or their procurement organizations; deliveries to middlemen or fuel cycle companies are not included. The sales between utilities in the Community are also excluded. The quantities covered are those which were entered into accounting records during the year stated.

[3]For deliveries made under medium or long-term contracts (i.e., for which the time between the date of signature and the date of the last delivery exceeds one year) the prices were expressed in seven different currencies. In order to calculate an average price, these prices have been converted into European Currency Units (ECU) and US dollars. The average prices were weighted by quantity and converted on the basis of the average annual exchange rate of the different currencies against the ECU and US dollar.

[4]Exchange rates are published by European Communities Statistical Office and the International Monetary Fund.

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